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THE ANNUAL MEETING OF THE ROYAL ECONOMIC SOCIETY

THE forty-fourth Annual Meeting of the Royal Economic Society was held at the London School of Economics on April 20, 1934.

The President, Professor Edwin Cannan, was in the Chair.

Before the transaction of the formal business, which is dealt with in Current Topics below, the President delivered the following address to members of the Society and their guests.

THE FUTURE OF GOLD IN RELATION TO DEMAND

A COST-OF-PRODUCTION theory of value is of little use for explaining fluctuations in the value of things which last a long time and exist in quantities which are very large in proportion to any annual additions which are made to them. We might reasonably refer to high cost of building materials and labour in accounting for the high value of houses in a district where new houses were springing up like mushrooms; but in a district where no new houses, or very few in proportion to the number existing, were being built, we should be content to think of the supply of houses as being furnished, not by the bricklayers and carpenters building new ones, but by the number actually in existence.

Some metals, iron especially, are subject to so much waste by various agencies that the annual production is large compared with the stock at each moment in existence, and in regard to these we rightly regard cost of production as a most powerful element in the determination of value. But the precious metals, of which we may take gold as the type, are only subject to comparatively small losses by abrasion, by being buried in the decayed teeth of corpses, and so on.

One consequence of this is that long before the general cost-of-production theory of value was abandoned, there grew up along-

side of it what was called a " quantity theory " for the value of money. Ricardo himself, though he tried to believe that cost was really the regulator of the value of currency as of all other important articles, yet declares roundly in the chapter on Taxes on Gold that the value of money is regulated *entirely* by its quantity. " The demand for money is regulated entirely by its value and its value by its quantity." The passage should be set alongside of the third paragraph of the first chapter of the *Principles*, which begins with a statement that the value of some commodities " is determined by their scarcity alone," but ends with the proposition that the value of these same commodities " varies with the varying wealth and inclinations of those who are desirous to possess them." McCulloch questions whether a classical education would not have spoilt Ricardo as an economist, and perhaps that is true, but I cannot help thinking that much trouble would have been saved if in his youth he had written essays for a vigilant preceptor armed with a big blue pencil. Of course, if the point had been clearly put before them, neither he nor anyone else would have denied that various things, among which the most obvious is a change in the magnitude of the working population, will vary the value of a currency when its quantity has not varied at all. By the time, early in the present century, when F. A. Walker wrote the article on the " Quantity Theory of Money " for Palgrave's *Dictionary*, the theory was reduced by those who supported, or at any rate did not dislike it, to the very innocuous doctrine that the value of money is determined, like the value of everything else, by supply *and* demand.

But it seems undeniable that throughout that long period the causes of variation in the value of money which lie on the demand side were very inadequately treated. Partly this was the result of a fault in the method of exposition of economic theory. The economists of the time were too fond of picking out some favourite influence and saying that something depended on this influence *ceteris paribus*, other things being equal, or the same, or disregarded. Then they would be attacked by someone who saw that some other influence had its importance and who could not or would not see that, no matter how much importance it had, it was one of the " other things " which were " impounded," as Marshall says, in the *ceteris paribus*, so that the proposition attacked was quite sufficiently protected. Even the supporters of the doctrine in question would often themselves forget this, and would defend the doctrine with acrimony, instead of pointing out

to their critic that it was quite open to him to pick out *his* favourite influence and relegate their own to the pound of *ceteris paribus*. In this way quantity and anti-quantity theorists had many a confused *mêlée* which might have been avoided if they had only seen that it did not matter two straws whether they said that the value of money depends on its quantity when the demand for it is unchanged, or that it depends on the demand for it when its quantity is unchanged. On the whole the attackers of the quantity theory were the worse equipped for the fight, and failed consequently to make the best of the case for the demand influences.

Besides this, the historical events of the period favoured attention to the quantity side of the problem rather than the demand side. The Black Death was a very old story, and I do not think any historian had ever hit on what seems the very obvious idea that the rise of prices which followed it was the result of the diminished population being left with an undiminished currency, so that David Hume's well-known supposition of the quantity of currency in each man's pocket being increased overnight was fulfilled by diminution of demand instead of by increase of supply. There was no such drop in population in the nineteenth century, and the increase which took place, though rapid, was continuous. The changes which occurred in the monetary demand of individuals and institutions were not spectacular enough to force people to face the fact that such changes might be important. On the other hand, at the beginning of the period the effects of increase of currency were fresh in men's minds in consequence of the issue of assignats in France and the Bank restriction in England, while in the middle and at the end of the period there were changes in the production of both gold and silver which were spectacular enough to call very general attention to them and continued long enough to affect appreciably the "quantity," and through the quantity, the value of gold and silver standard money.

But the war of 1914–18 opened a new era, in which the influence of demand has been no longer overshadowed by that of quantity. It is true that quantity had a magnificent innings in the Continental inflations, culminating when German thoroughness multiplied the mark till it fell to less than a billionth of its former value. But since 1914 we have seen first an immense fall in the value of gold money, and then an approximately equal rise, and this fluctuation, quite unprecedented in combined magnitude and rapidity, cannot be ascribed to any change in supply or quantity,

since the quantity has been increasing all the time, and rather more rapidly when the value was rising than when it was falling. Change in demand has been much more important than change in supply.

There seems good reason for believing that this supremacy of demand is likely to continue indefinitely. Great losses of existing quantity are almost impossible—even the amounts which go to the bottom of the sea are often recovered—and as the quantity above ground steadily increases, the proportion of what is still below ground becomes smaller, so that the likelihood of freshly discovered gold being large in proportion to existing quantity, and therefore having a big effect on its value, becomes smaller and smaller. Moreover, great and rapid changes on the demand side are more and more probable as the world becomes less bound by custom and tradition and more and more capable of arriving at conscious decisions. And, further, modern developments have industrialised the production of gold, so that instead of its being very largely a matter of chance whether much gold or little is being produced, we may rely on the production being encouraged by increase of value and discouraged by decrease of value almost as much as the production of iron or lead.

It is consequently desirable to reverse the common practice of forecasting the future value of gold by speculating on changes in its production and assuming that demand will either remain unchanged or steadily increase by some arbitrarily chosen figure such as three per cent. per annum. Instead, let us, at any rate for the time being, suppose that quantity will continue to increase at its present rate or at a rate very slowly diminishing, and ask ourselves what are the possibilities and probabilities in regard to demand.

Under the influence of the passion induced by war nations will melt down their church bells to make guns, and become willing to exchange even so venerated an idol as the gold store of their central bank for munitions and the military services of mercenary foreign troops. They have always done it, and would do it again if a great war should recur. But if that happens, scarcely anything will survive. Let us not worry over so horrible a hypothesis, but confine ourselves to the troubles of peace-time.

I think the first thing to notice is that modern changes have wiped out what used to be the biggest and steadiest demand for gold, namely, the demand for the pockets and tills of the people. No longer are wealthy persons described as "pursey"; no longer do tenants of farms and houses accumulate gold to pay

their next quarter's rent. Modern invention has provided a currency of paper, which most people have found more convenient, and recent legislation has taken care that all should use it whether they like it or not. Now, though this was an economy of gold, it was not a very big one, since few countries had any very large sum in gold in actual circulation, and such as it was, the central banks promptly nullified it to a great extent by increasing their holdings. The monetary demand for gold, the future of which we have to consider, is no longer the demand of the people for pocket and till money, but the demand of the central banks and of the persons who are called (not very correctly, as I shall show presently) "hoarders."

First then of the demand of the central banks. Can we forecast this at all? We may divide the subject usefully into demand by the banks of countries on the gold standard and the banks of the other countries.

Most of the difficulty in arriving at a clear comprehension of the working of the gold standard arises from the widespread belief that under it gold, instead of being moved in response to different offers like wheat and all other commodities, "flows" automatically about the world regardless of what can be got for it in the different countries. Confused by this belief, the monetary authorities of countries which were adding enormously to their central bank's stock of gold, have protested with their hands on their hearts that they have been unwilling recipients of the accessions which have poured in on them. They honestly think that their acquisition of the gold was not due to their offering more for it than other people, since they have been offering just the same amount as before—*in their own currency*. This, of course, ignores the fact that the fixed amount of currency given for each ounce of gold has no intrinsic unalterable value. Each of the fixed prices in currency offered for the ounce of gold can be and is varied in purchasing power from time to time, and gold is naturally sold to the country in which the fixed price has the highest purchasing power. Incapacity to appreciate this was the more inexcusable having regard to the fact that it had long been known that over-issue of paper currency led to "outflow" of gold: if outflow was caused by over-issue, why should not inflow be caused by under-issue?

The explanation of the mistake seems to lie in the common tendency to confuse general and national, that is local, economic phenomena. To each nation, thinking of itself alone, it seems obvious that plenty of gold means cheap gold *alias* high prices

reckoned in its own gold-standard currency, and therefore imports of gold, causing greater plenty of gold in the importing country, must, it seems, tend to cheapen the national currency. If the imported gold is not "sterilised" by being locked up in vaults without any additional currency being issued in consequence of its presence, this is, of course, true enough, but that does not prevent the purchase of the gold by the country in question from having its natural effect of tending to raise the world-value of gold. The national currency is lowered in value not to the value of gold as it was, but to its rather higher new value which is the consequence of the purchase. The diminution in the value has been caused not by the purchase and importation of the gold, but by the increase of the paper currency, and if that currency had been increased sufficiently to prevent any purchase and importation of gold, both its value and that of gold would have been lower than they became in consequence of the purchase and importation. The importation and consequent increase of currency kept the national currency and gold on the same level, but that level was higher than it need have been, inasmuch as the world-value of gold was raised by the unnecessary demand.

Even if this had been perfectly understood, there is little reason to suppose that it would have much affected the action of the national monetary authorities. Those of them who protested that it was due to no action of theirs that gold was pouring into their country were in reality unostentatiously rejoicing in its arrival, and would not have stirred a finger to stop it if they had known how to do so. The countries which received no inflow did not thank heaven that they were not acquiring, by the sweat of their brow in producing goods for export, a mass of unproductive metal, but bleated weakly about the "maldistribution" of gold, and were not sorry for, but only jealous of those who were getting it.

As it has been in the past, so it is likely to be in the future for another half-century at least. At the present rate of progress in economic education it is unlikely that understanding of the matter will become at all widespread in that length of time, and if it did, we may be fairly sure that the proper remedy would not be applied.

For what is that remedy? Evidently such a regulation of all the gold-standard currencies taken together as, in conjunction with the demand of non-gold-standard countries and the world's demand for industrial purposes, will keep the value of gold approximately stable. But is there the least probability of a

common authority being set up with the power of prescribing to each of all the national authorities how much gold it is to absorb for monetary purposes? I should say, certainly not. Regulation of armaments by mutual agreement is a comparatively simple matter compared with this, and yet is found, to say the least of it, very difficult.

In regard to regulation of demands for gold, as in the regulation of armaments, we have to face the fact that each country will inevitably play for its own individual safety. That safety under the international gold standard—if we assume that the standard is to be adhered to without capricious "goings off" at early and frequent convenience—is to be looked for in a large reserve of gold out of which a "run" for gold on the country by persons and institutions outside it may be met when it occurs. The danger of such runs has been much increased since the War by the slovenly conduct of national finances. Instead of following sound financial tradition and funding their short-term obligations incurred during the War at the earliest possible opportunity, governments have been beguiled by the lower interest of the short-term market into maintaining a mass of short-term obligations scarcely smaller than the whole debt of pre-war times. If held directly by persons abroad, the existence in any country of such obligations, payable in gold or in currency convertible into gold, obviously increases the foreigners' ability to draw out much gold, but it also does so even when the obligations are not held directly by foreigners. They are then held at home by banks and kindred institutions which naturally hold that they are safe in accepting large deposits from foreigners if they put what they receive into Treasury obligations which become due in gold in a few weeks.

As the recent conduct of governments suggests that they will go on neglecting the most favourable opportunities for funding, we may expect an increase rather than a decrease in the demands for large gold reserves by each nation which is to any extent the depository for property which the owners desire to keep liquid and outside their own country, and there is no reason to expect that this increase of demand by the depository countries will be met by a corresponding decrease in the demand of the other gold-standard countries. I do not overlook the widespread belief that extensive devaluation of currencies will meet and defeat the effect of a largely increased demand, but I think that devaluation as a single "once for all" change can only give very temporary relief. The American idea is reported to be that devaluation sets free "rivers of money" by making gold reserves larger in proportion

to liabilities. If, it is supposed, the liabilities of the banking system are 100 dollars and 40 per cent. in gold dollars are in reserve, and then the 40 gold dollars are each cut in half, and each of the halves are called dollars, there will be 80 dollars in reserve, and consequently there will be great "monetary ease." For the moment this may be so, but in the long run the demand for gold will not be diminished, since the liabilities reckoned in dollars will grow till they too are doubled and have reduced the reserves to the old 40 per cent. The amount which people want to keep "liquid," that is in such a form that they can be sure of having definite sums of money to spend or invest when they ask for it, bears at any time a definite relation to the general real wealth of the country. In spite of the many curious doctrines about the growth of bank deposits which[6] are prevalent, it is generally admitted that there is a connection between them and population and wealth. No one, I think, will doubt that if the gloomy prognostication of the panic-stricken bishop in August 1931 had been realised and the pound had fallen to what had been the value of the penny, bank deposits in this country, if it had withstood the shock pretty well, would now be already far on the way towards being 480 instead of 2 thousand millions. The diminution of the value of the unit in which deposits are payable will, of course, diminish the value of the deposits existing at the moment, but they will at once start climbing again till they reach something like the old aggregate value, so that if a currency is devalued to 50 per cent., we may confidently expect that after a few years the aggregate of deposits reckoned in the new units will be double what it was reckoned in the old units before the devaluation. And, of course, when that point has been reached, double the old quantity of gold reserve will be regarded as necessary, and the demand for gold will be just as large as before the change.

To put the same thing in another way, if all business were done in troy ounces of gold, and then legislation were passed providing that the ounce should be reduced from 480 to 240 grains, debtors under existing contracts would rejoice and creditors mourn, but no one would suppose that the demand for gold would be permanently reduced, any more than they would expect the demand for coal to fall if Parliament decreed that a ton should henceforward be 1120 instead of 2240 pounds avoirdupois.

Thus a once-for-all devaluation certainly raises prices, but it is once-for-all, and when prices have once risen in proportion to the devaluation, just as much gold will be demanded as before, and if there is a tendency to rise in the value of gold, this tendency

will resume its working. Of course, if devaluation were not once-for-all but was continuous, something per cent. this year, next year and all years after, it could successfully combat a continuing tendency to a fall of prices reckoned in the currency to which the devaluation was applied. But this would not affect the demand for gold for reserve against the devalued currency. With successive devaluations the amount of gold to be held in reserve against each dollar would be diminishing, but as the number of dollars would be proportionally increasing, the total of gold to be held would remain as before.

The question may be asked, Cannot the countries remaining on or returning to the gold standard expect any assistance in keeping down the value of gold from the central banks of the countries which remain off, or go off, the standard?

Far too sanguine hopes have been entertained in this direction. It has even been supposed by some that a stampede of countries going off gold might reduce the monetary demand for it almost to nothing. It was forgotten that before the fall of value went very far it would be abruptly checked by automatic returns to the gold standard by this and other countries which, when they went off it, suspended the provisions of their laws providing for the sales of gold by their banks, but did not suspend the provisions requiring purchases of gold. But this is only incidental. The really important fact about countries which go off the gold standard is that they do not in practice diminish their demand for gold but rather increase it. Countries like Spain and Argentina have been for long periods off the gold standard, and have yet maintained their gold holdings without diminution. This country went off in 1931 and has since increased its gold holding enormously. The United States, though holding much more gold than any other country, embarked on a gold-buying policy soon after deliberately departing from the old gold standard.

Countries off the gold standard have indeed a plausible excuse for holding a certain amount of gold. They can say that judicious management of such a fund—selling some of the gold when the foreign exchange goes badly against the country's currency and replacing it by purchase when the swing is in the other direction—will diminish violent fluctuations in exchange and thereby facilitate commerce with the outside world. This is perfectly true. The only trouble is that the management is not likely to be judicious. To use the fund judiciously the managers must be better speculators than the ordinary operators on the exchange markets. In fact they are inclined by the traditional worship of gold to be too

niggardly in parting with it, and to be too greedy in acquiring it. "Equalisation funds" are thus likely both to grow and to consist more and more largely of actual gold rather than of domestic and foreign currency.

Leaving the central banks, we have to ask ourselves what are the probabilities of increase or decrease of demand on the part of the other institutions and the individuals which are said to hoard gold. Hoarding is not really a very good name for their action. A hoarder is properly a person who keeps a store indefinitely because he likes to keep it. But the so-called hoarders of gold are becoming less and less of this type. They do not now bury much gold in their gardens with no clear idea of how it is ever going to be useful to them. They put it mostly in safe-deposit vaults—preferring a foreign country for the purpose, because governments have shown themselves more ready to steal gold from their subjects than from foreigners—with the full intention of taking it out and parting with it when it has risen in value measured in their national currency. They are speculators in gold, holding for a rise in its currency value. The more frequently devaluations take place, the greater are their holdings likely to be.

About the industrial demand, all we can say is that as gold is used chiefly for ornament and ostentation, and for these purposes high value is a recommendation, we can scarcely expect from that quarter any counteracting of the tendency of gold to rise in value.

If a monetary standard was known to be steadily rising, and to be certain to go on rising steadily at the same rate, the rise would probably be harmless. At any rate we may be sure that it would not cause the difficulties which come from unexpected violent deflation. Somehow or other people would get into the way of allowing for it in all their monetary transactions and contracts. But there is good reason for expecting the generally increasing demand for gold to act in fits and starts. Equalisation funds, central banks and hoarders are not at all likely to produce between them anything but an extremely unsteady demand.

Though it is going a little beyond my title, I should like to add that while gold has thus been deteriorating as a standard, the only alternative at present practicable, inconvertible paper currencies, independently controlled in each country, has greatly gained in respectability. While gold has been losing ground because the demand for it has become more unstable, inconvertible paper has gained ground because, though the doctrine of due limitation of quantity is still very imperfectly understood, limitation of some sort is, in fact, practised. The awful example of the effects of

unlimited issue which the Germans worked out in 1923 has terrified the world. Even the bold Roosevelt in search of a rise of prices, preferred to push the most unlikely buttons rather than the one labelled "greenbacks," which would certainly be effectual. So far neither England nor any of the countries which have gone off gold since she did in 1931, appear likely to go far towards limitless issue and bottomless depreciation. And if any of them should do so, it would not be from a misapprehension of the old kind but from an insane desire to give exports to the foreigner, not for gold but for nothing at all.

EDWIN CANNAN

THE DEMAND FOR MONEY

MOST quantity theories of money are ostensibly demand and supply theories. Unfortunately, less attention has been given to the demand for than to the supply of money. In fact, some expounders of the quantity theory ignore altogether the demand for money, and proceed on the assumption that it is only the supply that counts. This ignoring of the subject of demand and concentration on the subject of supply seems to be based on the further assumption that the demand for money is, at a given time and under a given set of circumstances, fixed; that it consists exclusively in the number of commodities and services that are for sale; that the elasticity of the demand for money is unity, or that the demand for one kind of money is the same as that for any other kind. None of these assumptions is true, either in theory or fact. At least, as must be granted even by its defenders, it is not to be accepted without a critical examination. The presumption is that the purchasing power of money is the resultant of two variable factors, the demand for it and the supply of it, and not of a single factor.

If the demand for money consists exclusively in the money work to be done, to use Walker's phrase, and if the money work to be done consists exclusively in the purchase of commodities and services, which is not true, as will be shown later, it would seem to follow that one kind of money would do as well as any other, and that one would have the same purchasing power as another, provided the quantity issued were the same. If that were true, going off the gold standard should not be followed by any depreciation of paper money, provided there was no increase in the quantity. Moreover, not only would irredeemable paper money have the same purchasing power as redeemable paper money, but non-legal tender paper would have the same purchasing power as legal tender, and paper which the Government refused to accept for duties and taxes would have the same purchasing power as money which it was willing to accept. This is known to be contrary to fact. It seems necessary, therefore, to re-examine the quantity theory. If the depreciation of irredeemable paper, or of paper which is not legal tender and not accepted by the Government, cannot be explained solely on the

ground of an increase in the supply of it, there is at least a possibility that it may have to be explained on the ground of a decrease in the demand for it.

The demand for money,[1] like the demand for anything else, is the resultant of two factors: the desire for it and the possession of something to give in exchange for it. This statement would stand even if one believed that the desire for money were infinite, or that it was the equivalent of the desire for everything that anyone wanted to buy. Even that desire for money would not constitute an effective demand for it unless there were things that could actually be given in exchange for it. The total number of commodities offered for sale constitute the ability to "purchase" money, and not the desire for it. To confuse the ability to purchase a thing with the desire for it is to fall into a logical error.

Besides, it is not correct to say that the desire for money is the equivalent of the desire for all the commodities and services that anyone cares to buy. That is like saying that the desire for axes is the equivalent of the desire for all the wood that axes will chop. There are other ways of getting wood. The total desire for axes is based on the superiority of axes over other instruments that might be used. It is the equivalent of the total desire for all the savings which axes make possible, over other known ways or instruments. Similarly, the total desire for money is based partly on the superiority of money over other ways of getting the things which money will buy, and partly on its utility as a store of value. It is the equivalent of the total desire for the savings which money enables us to make in the getting of the things which money will buy, and its superior convenience as a store of value.

A parallel argument contends that the utility of money is the utility of all the things which money will buy. As an explanation of the purchasing power of money this is singularly naïve. It ought to be reasonably clear that the utility of money is its usefulness. Why is money useful? Because of the economies which result from its use. Some of these economies are easily understood when one considers the difficulties of barter. Part of the usefulness, or the utility of money, consists in its power to remove those difficulties. To say, on the other hand, that the purchasing power of money depends on its utility, and that its utility is that of the things it will purchase, resolves itself into

[1] This is sometimes called the effective demand; but there seems to be no good reason for retaining the adjective.

the not very illuminating proposition that the purchasing power of money depends upon the things which it will purchase. That proposition, either in its abbreviated or its expanded form, still leaves us in the dark as to what determines how many things it will purchase.

If it is reasonably clear that the desire for money is one factor in the demand for money, and the possession by the people of commodities and services to give in exchange for it (to "purchase" it) is the other factor, we may proceed with our analysis. There are other ways of exchanging goods and services besides the use of actual money. If the money in existence becomes, for any reason, less desirable, more exchanges may be effected in these other ways. If this is done, there is a decrease in the demand for money, and, unless the supply is correspondingly decreased, its purchasing power will fall and prices, quoted in terms of money, will rise.

One of these other ways of effecting exchanges is direct barter, always an appreciable though minor form of exchange. Barter of commodities and services by means of book credit is of more importance than is appreciated by those who are not familiar with the practices of country stores. Exchanging services for goods is also a practice of some importance. Besides, the number of goods and services for sale is not unaffected by the kind of money available. In a period of unstable currency, farmers and some others reduce their trading operations. Subsistence farming and making goods for home consumption are ways of avoiding the use of a kind of money in which people have lost confidence. In extreme cases, such as the post-war inflation in certain continental countries, the resort to barter was noticeable. It was a way of making the necessary exchanges without having to accept a kind of money the purchasing power of which was perceptibly shrinking from day to day and from hour to hour.

Again, a depreciating or an uncertain currency may, in some cases at least, result in hoarding commodities. When, for example, it is believed that the money in circulation is of doubtful purchasing power, with a consequent instability of commodity prices, the owners of commodities have a motive for holding them. The present (January 1934) policy of the United States Government of offering higher and higher, or at least unpredictable, prices for gold, with the implied purpose of inflation, provides gold-miners and other owners of gold with an excellent motive for holding it. Nothing but the threat of a jail sentence or some other form of unpleasantness can counteract that motive. In

the case of gold, at least, there may be a decrease in the quantity offered in exchange for a kind of money which is, for any reason, deemed undesirable. The same may be true of other commodities. In short, the relative desirability or undesirability of the kind of money in circulation is a factor in determining the quantity of commodities and services offered for sale.

It may be suggested, however, that when the Government repudiates its promises to pay gold for paper, the circulation of paper money speeds up, and that this increase in the velocity of the circulation constitutes an effective increase in the supply of money. That the total power to effect exchanges by means of money is a product of the volume of money multiplied by its velocity of circulation is not questioned; but why should the velocity of circulation of paper money be speeded up by repudiation? One answer and, so far as the writer knows, the only answer, is that when paper money is no longer redeemable it becomes less desirable, and therefore is spent more promptly. It loses some of its desirability as a store of value. Those who have it are more anxious to get rid of it, or less anxious to keep it, therefore they spend it more quickly than they did when it was redeemable.

There are two replies to that argument, either of which is sufficient. First, the argument is an admission that irredeemable paper is less desirable than redeemable paper. If it is less desirable, there is less demand for it. If there is less demand for it, its purchasing power will fall unless the lessened demand is balanced by a decrease in the number of commodities and services offered for sale. Secondly, admitting that irredeemable paper is less desirable than redeemable paper, this is just as likely to affect the sellers as the buyers of commodities and services. If repudiation makes those who have money more eager to get rid of it and therefore more eager to buy, it also makes those who have commodities and services less eager to get it and therefore less eager to sell. They have to be bribed to sell by the offer of higher prices. There is no reason to think that potential buyers are more strongly affected by the decreasing desirability of money than potential sellers. The increased eagerness to buy is cancelled by a decreased eagerness to sell. The net result is likely to be no increase at all in the total sales, measured in terms of commodities and services, and no real increase in the velocity of circulation. Yet a decrease in the desire for paper money on the part of both buyers and sellers would certainly cheapen it. In short, it is the decrease in the desire for paper money and not

an increase in its velocity of circulation which explains its depreciation after repudiation. In reality, it is the decrease in the desire for it which explains any presumptive increase in its velocity.

One of the uses of money, or one of the purposes for which it is desired, is to serve as a store of value. This use may be less important than its use as a medium of exchange, but its importance is considerable. Using money as a store of value does not necessarily mean hoarding it, though it may mean that, and so long as there are hoarders, their desire for money must constitute a part of the total demand. But using money as a store of value may also mean keeping a little money in one's pocket for unforeseen uses when cash may be necessary, it may mean keeping an adequate working balance in one's cash drawer, and, of course, it may mean keeping adequate bank reserves. This use of money is closely associated with its use as a medium of exchange, but the two uses are logically separable. In order to serve effectively as a store of value, an article must have general and fairly stable purchasing power. Other things besides money have this kind of purchasing power and may and do serve as stores of value. The precious metals in bullion form as well as coin serve this purpose. So also do precious stones, jewellery, rich raiment, and various other things. On the other hand, bank cheques serve very well within limits as media of exchange, but not as stores of value.

In times of rapid inflation, money becomes a poor store of value, though still serving as a medium of exchange. In such times, other commodities tend to be substituted for money as stores of value. This is coming to be called hoarding commodities, but the phenomenon is not new. Oriental countries have long used, as stores of value, commodities which combine great value with small bulk. At the present time in the United States, with the threat of inflation hanging over every one, there is a noticeable tendency to store up other durable things, such as canned goods, clothing, and even bedding. While these are stored for home use rather than as a fund of purchasing power, and are therefore rather poor stores of value, nevertheless they seem to be displacing money, to a slight degree, as a store of value.

As a result of this slight tendency to substitute other commodities for money as a store of value, there is, first, a slight increase in the demand for those commodities that can be stored, and, secondly, a slight decrease in the demand for money. The

combined result of these is a fall in the purchasing power of money and a rise in the price index. This results in a greater fall in the purchasing power of money than could be explained solely on the ground of an increase in its supply. In fact, as shown above, there may be a fall in the purchasing power of money without any increase in its supply. In that case, the total purchasing power of all the money in the country may decrease without any decrease in the number of commodities and services on the market. There may also be less total purchasing power in the form of money after inflation than before. That would certainly happen if inflation decreased the desire for money and increased the desire for other commodities as a store of value. The elasticity of the demand for money may be less than unity.

There is a somewhat popular but incorrect opinion to the effect that the total purchasing power of all the money in existence must be equal to the total purchasing power of all the exchangeable commodities and services in existence. The only possible way of supporting this opinion is to say, first, that the total purchasing power of money is the product of its volume multiplied by its velocity and, secondly, that the total purchasing power of commodities and services is the product of their volume multiplied by their velocity. This is a dangerous and unsatisfactory subterfuge. There is, to begin with, the difficulty of attaching the concept of velocity to a service which is rendered and paid for but once. Again, there is no necessary relationship between the velocity of money and the velocity of the commodities and services which sell for money. In order to find out what is the velocity of a hodge-podge of commodities and services, each of which has its own velocity, if it has any, it is necessary to beg the question by assuming, to begin with, the equality of the two products mentioned above. Having made this assumption, the process is simple. It is only necessary to find, first, the product of the volume of money multiplied by its velocity, and, secondly, the volume of commodities and services. Then you divide the former by the latter, a process which does not add anything to the assumption with which it started.

There is only one definite ratio that can be established between the value of money and the value of commodities. At a given time, a certain quantity of money is being transferred from one person to another in the purchase of commodities, and a given quantity of commodities is being transferred from one person to another in exchange for money. These two quantities, the money actually being paid for commodities and the commodities actually

being sold for money at the same time, may be assumed to be equal in value or purchasing power. But, at that time, there is a great deal of money and a great mass of commodities not in process of transfer. Between these two quantities there is no necessary or known ratio. It may change from time to time, and there is no possible way of determining in advance what that ratio is likely to be.

As already stated, the demand for money is the resultant of two factors: the desire for it and the number of things available for sale. The desire for it is, in turn, made up of several elements. First, there is the fact that the Government will accept it in payments to itself; secondly, there is the fact that creditors must accept it; thirdly, there is the fact, sometimes, that the Government will give gold for it; fourthly—a resultant of the first three—there is the fact that custom has made it acceptable in private purchases. Remove any of these elements and the purchasing power of money will decrease without any increase in the quantity of money or any decrease in the number of commodities and services available for exchange.

One element in the desire for money—that is, one of the things which make it desirable—is the fact that the Government will accept it in payments to itself. This element alone would create a demand for money and enable the Government to float a small quantity, even of irredeemable and non-legal tender paper money, without depreciation. Take away this element—that is, let the Government refuse to accept it, even in the purchase of postage stamps—and it becomes less desirable, and still less could be circulated without depreciation. An excellent illustration is found in the famous case of President Jackson's Specie Circular. Large numbers of state bank-notes which had no other basis of value were enabled to circulate by the simple fact that the Government of the United States was willing to accept them in payment for Government land which was then being sold on a large scale. When the President announced in his Specie Circular that only specie would thereafter be accepted, the sole basis of the value of many of those bank-notes was destroyed, and they became practically worthless. Even private companies, when the law permitted it, have been known to issue their own scrip and circulate it, very much as money circulates, in local communities. They did this by simply accepting their own scrip in the purchase of supplies at the company stores. Let such company refuse to accept its own scrip and the value of the scrip would disappear as promptly as that of a bank cheque disappears when it cannot

be converted into cash, or as state bank-notes did when President Jackson refused to accept them in payment for Government land.

So long, therefore, as the Government is willing to accept a given kind of money in payments to itself, that fact alone makes it desirable, and creates a demand which will enable it to float, in limited quantities, without depreciation. Let the Government refuse to accept it for customs duties, or for any other payment to itself, and it becomes less desirable. Again, let the Government actually accept one kind of money, but refuse to accept another, and the one kind becomes more desirable than the other. In such a case, it is incorrect to say that all kinds of money are equally desirable. Less of the kind discriminated against could be circulated without depreciation than would be possible if there were no discrimination.

Another element in the desirability of money is the fact that it is legal tender for the payment of all debts, private as well as public. That fact makes it desirable to debtors, and their desire would create a certain demand for it and enable a limited quantity to circulate without depreciation. Take away this element of desirability from money in general, or from a given kind of money, and it becomes a little less desirable. Make one kind of money full legal tender but not another, and the former becomes more desirable than the latter.

Another large element in the desirability of money, probably a resultant of the other two, exists when custom has made it acceptable in the purchase of all commodities and services from private individuals. It is too frequently assumed that this is the sole element in the desirability of money. The fact that the Government agrees to accept it, and does not discriminate against one kind, together with the fact that creditors must accept it, are elements of almost equal importance. In fact, without these two elements it is not certain that the custom of receiving money, or any given kind of money, especially irredeemable paper, in the purchase of commodities and services would ever become general.

This suggests an interesting subject for research. Let some investigator make a study of the known and verifiable cases of paper money of the following description. First, it is not redeemable or convertible into metallic money. Secondly, it is not accepted by the Government which issued it in payments to itself. Thirdly, it is not legal tender. Fourthly, it circulates generally and is generally accepted by private sellers in payment for goods

and services. Such a study might yield significant even if negative results. The paucity of such cases would at least suggest the thesis that the fourth of the above-named conditions depends upon one or more of the first three. In other words, the desirability of paper money as a general medium of exchange depends upon another form of desirability which has to be created by positive action on the part of the Government or the authority which issued it. Such positive action may consist in the promise to exchange gold or silver for it, in the promise to accept it in payments to itself, or in a legal tender law requiring creditors to accept it.

This brings out an important difference between paper currency and that which is sometimes miscalled "bank money," but which should be called bank credit or, better still, bank cheques. This so-called "bank money" is not accepted freely from every one in payments to the Government, it is not legal tender for the payment of debts, and it has not yet become customary to accept it without a personal guarantee or endorsement in the purchase of commodities. The sole element in the desirability of this so-called "bank money" is its convertibility, or, more accurately, the ability of the holder to get currency for it. The instant it loses its convertibility or its redeemability in currency it loses all or practically all of its desirability and becomes worthless even as a medium of exchange. The demand for commodities does not constitute a demand for this so-called money.

In this respect, "bank-money" may seem to bear the same relation to currency that gold-supported paper currency bears to gold. But this is only one point of similarity. In at least three other respects they are dissimilar. Paper currency has, as stated above, three other elements of desirability besides its redeemability. These are, to repeat, its acceptance by the Government, its legal tender quality, and the fact that it has become customary to accept it in full and final payment for commodities and services. Because of these three elements of desirability, paper currency, in considerable quantities, may continue to circulate, without serious depreciation, even after it has lost its redeemability. "Bank money," having none of these other elements of desirability, and being dependent solely on its redeemability, loses all its value and all its circulating power when it loses its redeemability.

This also explains a fact of common observation, which some of the more extreme members of the so-called "hard money"

school have never been able to explain. These extremists have insisted that, without redeemability in some kind of money having a metallic value, paper money must necessarily depreciate more and more. It might, they were willing to concede, circulate for a time through the sheer momentum of custom, but, without a metallic base, or without redeemability in some kind of money the value of which depended on something else than the fiat of Government, it must eventually decline. These extreme theorists overlooked the other elements in the desirability of paper money. When these other elements of desirability are present, our conclusion is that irredeemable paper money will circulate, *in limited quantities*, without serious depreciation.

Certain champions of paper currency accept this conclusion and then proceed to make too much of it. They are in the habit of saying that if the Government will not discriminate against irredeemable paper, it will have the same purchasing power as gold, provided the quantity of paper currency is not increased too far. In other words, if the Government will accept paper on a parity with gold in all payments to itself, which is quasi-redeemability, and if it will declare both paper and gold to be full legal tender for all debts, paper, it is claimed, will circulate on a parity with gold even without the element of redeemability.

This overlooks one of the most important elements in the desirability of paper money, namely, the ability to get gold for it. There are, or have been, two ways of getting gold for paper: one is to go on the market and buy it at the prevailing price as one would buy any other commodity; the other is to go to the Treasury or the Central Bank and get a fixed quantity of gold for each and every paper unit presented. The first of these two methods does not preserve any fixed ratio between the purchasing power of gold and that of paper money. The other, which is called redemption, does preserve such a ratio. Moreover, the latter method gives greater desirability to paper money than the former. It is more advantageous to the possessor of a paper dollar, pound, franc, mark, or lire to know that he can always get a fixed quantity of gold for it—say 25·8 grains, 9/10 fine, for a dollar, than to know that he can always go on the gold market and get an uncertain and unpredictable quantity for his paper unit.[1] To some people at least, a paper dollar redeemable in a fixed quantity of gold is more desirable than one not redeemable,

[1] Of course, the principle is the same no matter what the unit of value may be. For convenience, therefore, the writer will use the dollar, with which unit he is more familiar.

even though the latter will purchase some uncertain and variable quantity of gold on the market. While, therefore, considerable quantities of irredeemable paper can be circulated without depreciation, still larger quantities of redeemable paper could be so circulated.

The interchangeability of gold and paper is not the only kind of interchangeability. In the United States we have several different kinds of paper money, but it is the policy of the Government and the banks to keep them all at par with one another. In order to accomplish this, they are all interchangeable at the Treasury and at the banks. Because of this interchangeability, they are all virtually fused into one kind of paper money. The average man never notices nor cares to notice what kind of paper money is offered him so long as he is satisfied that it is not counterfeit. All kinds of paper money look alike to him. He probably does not even know the difference between one kind and another until it is explained to him. If they were not interchangeable, he would probably know the difference. At least he would have a motive for learning about the different kinds.

Because of this interchangeability, different kinds of paper money circulate at par with one another even though there are differences, which, to some, may seem important. The United States notes (greenbacks), for example, are technically not acceptable in payment of duties on imports. Even though they were actually rejected by the collectors of duties, they would probably circulate at par with other forms of currency so long as they were all interchangeable. If the offer of greenbacks should be rejected, the payer of an import duty could walk to another window and get some other kind of money in exchange for his greenbacks and pay his duty with the other kind. In short, interchangeability is so important in determining the relative desirability of different kinds of money as almost, if not completely, to neutralise all other differences. This applies to differences between gold and paper as well as to differences among the various kinds of paper. So long as paper is redeemable in gold, or so long as they are freely interchangeable, their parity becomes so much a matter of course that it is easy to forget the underlying cause of their parity. It is the fact of convertibility that makes one kind of money as desirable as any other.

It is no answer to say that no one wants gold so long as paper money will purchase everything that gold will purchase. The fact is that gold is desired, in smaller or larger quantities, for other purposes than the purchase of commodities. The fact

that those who want it for these other purposes can always get it at the Treasury, in definite and known quantities in exchange for paper, is an element in the desirability of paper. Even though gold be desired for those other purposes by very few persons, nevertheless these few, with their desire for gold, and their purchasing power, constitute a part of the total demand for paper money. Serve notice on them that the Government will no longer redeem paper with gold, and their desire for paper will be somewhat diminished. Those who merely want gold as a store of value are a part of the market, and their desire for gold is a part of the demand for paper money.

More important, of course, is the desire for money for use in international trade. Paper money, not being legal tender in foreign countries and not being accepted by foreign governments in payments to themselves, lacks two elements of desirability abroad which even irredeemable paper possesses at home. Foreign sellers have a weaker desire for our paper than our own sellers show. Since foreigners prefer gold to our paper, those engaged in foreign trade, or having payments to make abroad, are also likely to prefer gold to paper, dollar for dollar. For the same reason, they have a stronger desire for redeemable than for irredeemable paper. If they cannot get gold in definite and known quantities for paper, their desire for paper weakens. Their weakened desire reduces the total demand for irredeemable paper. In short, both foreign traders and those who desire a store of value show a weaker demand for irredeemable than for redeemable paper.

Moderate advocates of paper currency accept this as a fact, and propose a scheme under which gold in fixed quantities may always be had at the Treasury for purposes of international payments. With this limited redemption of paper in gold, it is hoped that paper money can be kept from depreciating by merely refraining from increasing the quantity of it. This is an admission that the ability to get gold for paper is an element in the desirability of, and therefore in the demand for, paper money. In other words, it is not altogether a question of supply. But this admission prepares the way for another.

In a time of uncertainty, such as the present, the desire for a store of value becomes rather strong. Until confidence in the Government is restored, paper money does not fully satisfy that desire. The Government, having repudiated its promise to pay gold for paper, has helped to destroy that confidence. The desire for paper money is perceptibly less, or the preference for

some other store of value is perceptibly stronger than it was before the repudiation.

The question has come up in the United States whether reducing the gold content of the dollar will cheapen it and raise prices. By reducing the gold content of the dollar is meant giving fewer grains of gold for a dollar. Whether a fixed quantity of gold is given for paper dollars by the United States Treasury, under the old plan of redemption, or whether fixed quantities are sold for a dollar, under the proposed new Government-controlled gold market, should make no difference. The essential point is that the Government, through one agency or another, agrees to give a fixed quantity of gold for every paper dollar presented. The question at issue is, Will a reduction in the number of grains given for a dollar tend to cheapen it in terms of other commodities as well as gold; that is, will it raise prices?

Before seeking a final answer to that question, three preliminary questions may be raised: first, if decreasing the gold content of the dollar or any other unit by 50 per cent. will not cheapen it and raise the general price level, will a decrease of 100 per cent. in the gold content cheapen it and raise prices? Secondly, if decreasing the gold content of the unit 100 per cent. will not cheapen it, of what use is the gold standard? Thirdly, is there any middle ground between two positions: first, that a decrease in the gold content of the dollar will raise commodity prices; and secondly, the position that the gold standard is of no use whatsoever, and we might as well continue indefinitely with our irredeemable paper money?

Most monetary theorists, at least those who believe in a gold standard, will agree that, without redeemability, paper money will depreciate to some degree. That seems to imply that paper money gets at least a part of its purchasing power from its redeemability in gold. It would scarcely be consistent with that conclusion to say that a smaller quantity of gold given for a paper dollar would give it the same purchasing power as a larger quantity. Yet that is virtually the position of those who deny that decreasing the gold content of the dollar will cheapen it.

The question becomes, therefore, Can as many irredeemable as redeemable paper units be circulated without depreciation? If so, keeping a gold reserve for the purpose of redeeming paper is a useless waste. If not, redeeming paper with less gold will make paper money cheaper than redeeming it with more gold.

Another idea, somewhat current at the present moment, is that paper supports gold as truly as gold supports paper. If

that means that the suspension of gold payments, or going off the gold standard, is as likely to result in a cheapening of gold as of paper, it can be easily tested. So long as gold and paper are freely convertible, they will, of course, have the same purchasing power. So long as that is true, there is no empirical demonstration that gold does not derive a part of its purchasing power from the fact that paper can always be had for it. The test comes when they are severed by the suspension of convertibility. If paper falls in purchasing power and gold does not, it would seem to demonstrate that gold had been supporting paper, and not that paper had been supporting gold. In short, it is about as absurd to say that paper supports the purchasing power of gold as to say that bank cheques support the purchasing power of the currency for which they are exchangeable.

In no other way can the present depreciation of the paper dollar be explained than on the ground that it derives a part of its desirability from its convertibility. There has been as yet (January 1934) no increase in the supply of paper money in the United States. The depreciation must be explained on the ground of a decrease in the demand for it. That decrease in the demand for it cannot be explained on the ground of a decrease in the number of commodities and services available for exchange. It must be explained on the ground of a decrease in the desire for paper money. That decrease in desire followed immediately after repudiation. In short, repudiation did not increase the supply of money; it reduced the demand for paper money by destroying one element in its desirability.[1]

While it is freely admitted, in this paper, that *limited quantities* of irredeemable paper money may circulate without depreciation in terms of a price index of commodities, we have purposely laid emphasis on the words "limited quantities." If our reasoning is correct, a larger quantity of redeemable than of irredeemable paper can be circulated without depreciation. This is shown also by the fact that, after the United States repudiated its gold promises, its paper money began to depreciate without any increase in the quantity in circulation. If it had been desired to prevent depreciation, it would have been necessary to reduce the quantity of money in circulation. This suggests some possible difficulties when the time comes, if ever, when it is desired to

[1] It may be argued that paper prices in England did not rise after the Government repudiated its gold obligations. What happened, however, was a definite check in the downward tendency of prices which had been going on for some time. To check a downward tendency of prices, under any theory of economic causation, is the same as to start an upward tendency.

stop further depreciation. It may be necessary to impose on the country a shortage of money in order to counteract its decreasing desirability and to check depreciation.

The fact that paper money has other elements of desirability than its redeemability in gold helps to explain the lag in the rise in the price of commodities when the gold content of the dollar is decreased.[1] If the sole element in the desirability of a paper dollar were the ability of the holder to get gold for it, there would be no such lag. A paper dollar would, in that case, be very much like a bank cheque. Let a bank announce that all existing cheques would be redeemed, not at 100 per cent., but at 70 per cent. of their former value, and the purchasing power of each outstanding cheque would instantly fall to 70 per cent. of its former value. With a paper dollar, however, there are the three other elements of desirability discussed above. That being the case, its total desirability does not instantly decrease in exact proportion as the decrease in the quantity of gold which may be had for it. It will still be accepted by the Government on the old basis; it will still pay debts at the old rate, and the customary prices of many commodities will continue through sheer momentum.

In the purchase of foreign goods in foreign markets, the purchasing power of the monetary unit does fall rather promptly in proportion as the gold content is reduced. The reason seems to be that, in foreign countries, paper money occupies a position somewhat analogous to that of a bank cheque at home. That is to say, the foreign government does not accept it, it is not legal tender, and it does not possess the customary value it has in its home country. In other words, its principal if not its sole element of desirability is found in the ability of the possessor to get gold for it. Reducing the gold content, therefore, reduces its desirability promptly and proportionately in a foreign market.

It is the belief of the writer that this analysis of the demand for money, or some analysis, laying emphasis on the different elements in the desirability of money, the varying desirability of the same kind of money in different places, and the differences in the desirability of different kinds of money in the same place, is necessary to explain many points in monetary theory and history. This is well illustrated by the history of the greenbacks during the American Civil War. There was no great quantity

[1] Raising the paper price at which gold is bought and sold on the official, Government-controlled market is here considered as equivalent to decreasing the gold content of the dollar.

issued, and, more particularly, there was no great or sudden increase in that quantity after the suspension of specie payments during the war, yet they promptly depreciated. The only adequate explanation is that they lost one element of their desirability when they lost their redeemability. Another element of desirability was destroyed by the clause which declared that they were not legal tender for the payment of duties on imports.[1] Again, as Professor W. C. Mitchell has shown,[2] the depreciation of the greenbacks fluctuated according to the failure or success of the Union armies. There were no changes in the supply to explain these fluctuations. The only reasonable explanation is that greenbacks seemed more desirable when the Union armies were succeeding than when they were failing. The reason for that was probably that the prospect of their redemption seemed less remote when the Union cause was gaining than when it was losing.

Again, after the Resumption Act of 1875, which provided that the Government should begin paying specie for greenbacks on January 1, 1879, the purchasing power of the greenbacks steadily rose until they reached parity with gold on the morning of the day when specie payments were resumed. There was no decrease in the supply of paper money during this period to explain this rise in its value. It was wholly the result of an increase in its desirability. There was, for those six years, a steady fall of prices from the plateau of inflated paper prices to the low ground of gold prices.

As stated above, the present depreciation of the American paper dollar cannot be explained on the ground of any sudden increase in the supply after repudiation. One may go further, and safely predict that if the Government should definitely return to gold payments with the gold dollar of its former weight and fineness, the purchasing power of the paper dollar would rise promptly, even though there were no decrease in the quantity in circulation or in existence. Some increase in the purchasing power of the paper dollar would probably result even from a partial resumption of gold payments. Suppose, for example, that the Government would pay gold for paper at the old ratio in limited quantities and for certain specific purposes (even for such minor uses as dentistry), even this would make paper a little

[1] Neither were they legal tender for the payment of interest on the public debt, but this could hardly have affected their desirability from the standpoint of a private individual.

[2] *A History of the Greenbacks*, pp. 203–205. University of Chicago Press, 1903.

more desirable and would, theoretically, slightly though perhaps imperceptibly, increase its purchasing power.

Let the Government agree to pay gold for paper at the old ratio for such an important purpose as international trade, and paper money would become considerably more desirable than it is now to those engaged in foreign trade. More could be circulated without any decrease in its supply, or it would take a corresponding increase in the quantity of money to hold prices at their present level. If there were not too much paper, such a policy of partial redemption might even bring paper back to its old parity with gold. But the point is, that this limited redemption would not make paper quite so desirable as it would be under full and unlimited redemption. As a result of this, not so large a quantity of paper money could be circulated without depreciation under limited as under full redemption.

This fact of full and unlimited redeemability is a factor of such great importance as to appear, at times, to be the only element of desirability. Under full redeemability, paper money will continue to circulate at par with gold, even though paper is neither legal tender nor accepted by the Government for all payments to itself. So long as the Government actually exchanges gold dollars for paper dollars without limit as to quantity or purpose, every paper dollar is essentially as desirable as any gold dollar. Under this policy, or so long as it can be carried out, no matter how many paper dollars are issued, they can never be any cheaper than gold dollars. There may be difficulty in keeping large enough gold reserves to redeem excessive issues of paper, but so long as the Government manages to do it, gold and paper must remain at parity no matter how large the issues of paper money.

Under these conditions, or so long as they can be maintained, the only possible way of cheapening money is to cheapen gold. Large issues of paper money may, under certain conditions, cheapen gold, and under other conditions they may make gold dearer and actually bring about a fall in prices.

Let us assume (a condition which was once real) that there is a great deal of gold in the country, some of it in actual circulation as coin, and, at any rate, vastly more than is needed as reserves for redeeming paper money. Under such conditions, an increase of paper money would displace a certain quantity of gold from circulation and release it for other uses and for circulation in other countries. This would tend to cheapen it, or to reduce its purchasing power. Further increases in the quantity of paper

money would continue to displace gold, reduce the mint demand for it, and make the displaced gold available to supply other demands, *up to a certain point.*

When that point is reached, further issues alarm those who know the situation, start a scramble for gold, increase the demand for it, make it dearer, and cause a fall in prices. That point is reached when there is so little gold left in the country as to make it difficult to find enough with which to redeem paper and support the superstructure of credit. In order to get enough gold for those purposes, the Government itself must lead in the scramble for it and become the chief hoarder. Others, fearing that the Government may be forced to suspend gold payments, get panicky and join in the general scramble. When this point is reached, paper money ceases to be desirable as a store of value, while gold becomes supremely desirable for that purpose. Hence there is an increase in the total demand for gold. There is a run on the Government for its gold by the holders of paper. Fundamentally it is like a run on a bank by its depositors. The Government may eventually be forced to suspend gold payments, but until it is, gold and paper continue to circulate at parity, in spite of the facts that gold is getting dearer and that prices are falling. In these final stages, it can literally and truly be said that the later increases in the quantity of paper money actually cause a fall in prices.

When there is so much paper and so little gold in the country as to make it somewhat difficult to redeem paper in gold, it is fatuous and futile to try to stimulate prices by issuing still more paper money. Under such conditions, the way to raise prices would be to retire some of the paper money, to stimulate gold production, artificially if necessary, to put less gold in the dollar, which is partial repudiation, or to repudiate altogether by going off the gold standard.

Repudiation at once destroys the necessary parity of gold and paper and, unless there is a very limited supply of paper, it must somewhat cheapen the paper dollar. Since it was the excess of paper which forced repudiation, the quantity of paper cannot be assumed to be small. Therefore depreciation instantly follows repudiation. To repeat, repudiation removes a very important element in the desire for paper money. As soon as that element of desirability is removed, the demand for paper money decreases and its purchasing power falls. The increase in the quantity of paper money does not produce a fall in its purchasing power so long as that element of desirability called redeemability exists

as a fact. As soon as that element disappears, the purchasing power of paper money falls without any further increase in its quantity.

The final conclusion of this paper is that students of monetary theory in general, and quantity theorists in particular, should hereafter give at least as much attention to the demand for as to the supply of money. This is especially important at the present time. The United States Government has suddenly launched on a new and untried experiment in monetary policy —that of a managed currency. If the reasoning in this article is sound, to control the supply of currency will not be enough. The demand for it must also be kept under control. This paper in no way combats the theory that the quantity of money is a factor in determining its purchasing power. It merely contends that there is another factor of equal importance—namely, the demand for money. It is contended, further, that the demand for money is the resultant of two factors: the desire for it and the possession of other things to be given in exchange for it. Finally, it is contended that the desire for paper money may be based on four desirable elements: first, its redeemability; secondly, its acceptance by the Government; thirdly, its being legal tender; and fourthly, a resultant of one or more of the first three, its customary acceptance by private sellers. When paper money possesses all four of these elements of desirability, there is a greater demand for it than when it possesses less than four. Consequently, a larger quantity of paper money possessing all four elements can be circulated without depreciation than would be possible if any of the four were lacking.

T. N. CARVER

ON THE RELATIONSHIP BETWEEN INVESTMENT AND OUTPUT

I

THE value of the stock of capital conceived as the discounted value of the expected future products, or conceived as the result of investing factors of production for definite periods, are, of course, essentially different ways of representing the same thing. Both methods of approach, if they are to prove useful for purposes of closer analysis, make inevitable a more detailed investigation of what I like to call the time structure of production, *i.e.* of the different periods for which either individual services have to be discounted or for which individual units of factors are being invested. I hope to show in the course of this article that neither of the two aspects without the other is sufficient to give a satisfactory explanation of the actual relationship. But the way in which the two aspects can be combined has never been made quite clear. Even the exact nature of the concepts which underlie the two different methods of approach has hardly ever been explicitly defined. I propose here to devote myself to an attempt to elucidate the relationship between the two concepts, and to develop some consequences which seem relevant to current controversies in this field.

The next three sections of this paper are accordingly devoted to the somewhat laborious task of explaining and co-ordinating the different aspects in which the time intervals arising in the process of production present themselves. Beginning in Section II with the representation of the time-shape of the labour stream applied in any one process, in the following section the relationship of this stream to the time-shape of the output stream derived from the labour invested at a moment of time is studied, and in Section IV the corresponding magnitudes are discussed for the case of durable goods. Only in Section V then an attempt is made to show what real phenomena correspond to changes in the different magnitudes discussed, to what extent they represent real independent variables or are only derived constructions, and how the state of equilibrium described with the help of these constructions is brought about in the actual world. Finally, in Section VI, the relevance of these equilibrium-considerations

for the explanation of a dynamic process is investigated and an attempt is made to show that, although it cannot be assumed that the existing capital goods are the result of a past process exactly similar to that in which current labour is invested, or that at any moment any capital goods are produced without the help of already existing capital, yet the existing stock of capital goods will always make the investment of labour for a definite range of periods necessary if the capital is to be maintained intact. It will appear that, contrary to a widely held opinion, the concept of a definite time-structure of investment is even more important for the understanding of the dynamic processes of the accumulation and consumption of capital than for the mere description of the conditions of a stationary equilibrium.

Any discussion of these problems within an article makes it inevitable to leave out a number of considerations which are highly relevant to a really satisfactory treatment of the main point. This applies in particular to the determination of a definite rate of interest, which is here taken for granted, its relation to saving, and the concept of free capital. I hope to discuss these systematically side by side with the problem selected here in a more comprehensive study. Yet in spite of these inevitable shortcomings of an anticipatory treatment of the special problem selected, it seems to me to be justified in view of the light it sheds on the relationship between what has come to be known as the " Marshallian " and the " Austrian " (*i.e.* Jevons—Böhm-Bawerk—Wicksell) approach to the theory of capital.[1, 2]

It is necessary to begin by drawing a clear distinction between the two different ways in which time may be a condition to the production of the ultimate services to the consumer. This distinction between the actual time a process of production lasts and the time through which a product will give its services, to which corresponds the distinction between goods in process and

[1] Marshall himself was, of course, aware of the double aspect presented by capital, which he described as that of accumulation and discounting (cf. *Principles*, V, iv, 2, also mathematical notes v, xiii, xiv, and xxiv). But it is probably true to say that he impressed the latter aspect so much more strongly on his disciples that it has become dominant among English economists. And the same applies, *mutatis mutandis*, to Böhm-Bawerk and his followers.

[2] Although little attempt is made to deal directly with objections raised recently against the " Austrian " approach to the theory of capital, much of what follows is an implicit reply to some of the most important recent contributions to the subject, such as F. Burchardt, " Die Schemata des stationären Kreislaufs bei Böhm-Bawerk und Marx," *Weltwirtschaftliches Archiv*, vols. 34 and 35, 1932–33; Frank H. Knight, " Capitalistic Production, Time and the Rate of Return," *Economic Essays in honour of Gustav Cassel*, London, 1933, and M. Hill, " The Period of Production and Industrial Fluctuations," ECONOMIC JOURNAL, December 1933.

durable goods, is of special importance in this connection. For in each of these two cases only one of the two fundamental magnitudes to be discussed here can be considered as a directly given independent variable, while each can be derived from the other only if the rate of interest is given, and is therefore in a sense a mere construction. Under these circumstances it is not surprising that of the two schools mentioned above, that which thought of capital almost exclusively as of durable goods concentrated almost exclusively on the one of these magnitudes, the *output function* (although this concept has not been clearly formulated by it [1]), while the other school, which thought of capital primarily in terms of goods in process, made the other magnitude, the *investment function* (which is the more exact formulation of what they called the period of production), the starting-point of their attack. It seems to me, however, that in neither case will one alone of the two concepts provide a sufficient instrument of explanation, and that, in particular, the effects of changes in the data can be understood only if the relation between these two concepts is cleared up.

II

It is convenient to begin with the discussion of goods in process, and this and the following section of the present paper will be devoted entirely to this aspect of time in production. In order to distinguish its effects sharply from any effects due to the durability of goods and to avoid for the present all complications arising out of the fact that the phenomena are regularly combined, it is necessary to assume that in the process in question no durable goods are used, and to define as one process that series of activities which results in a product that is finished and consumed at one moment of time.[2]

Such a process of production can then be represented by Jevons' Investment Figure [3] shown in Fig. 1 *a*. The time during which the process proceeds is here measured along the abscissa, while the quantities of "labour" applied in the course of the process up to any one moment are shown cumulatively as the ordinates of the curve OL_1' for the corresponding points of the T-axis. "Labour" stands here and throughout this article for an

[1] The only clear formulation of this concept known to me is to be found in a yet unpublished thesis of Mr. V. Edelberg.

[2] This is essentially the assumption made in *Prices and Production*, where considerations of space made it impossible to show how durable goods could be included in the scheme. It is hoped that the present paper will to a certain extent make up for this deficiency.

[3] This very appropriate designation has been suggested by Dr. J. Marschak (*Archiv für Sozialwissenschaft*, vol. 68, p. 395).

assumed uniform original factor of production. Intermediate and final products are represented in such units as are the product of a unit of such "labour," so that each ordinate of the curve OL_1' measures the quantity of intermediate product at the respective stage of production, while the final output, obtained at the end of the period OT_1, is equal to T_1L_1', or the total quantity of labour applied in the course of the process. The slope of the curve OL_1' at any one point represents the rate at which labour is applied at the corresponding moment. The diagram, in short, shows the distribution in time of the total quantity of labour that contributes to the output of a moment of time.

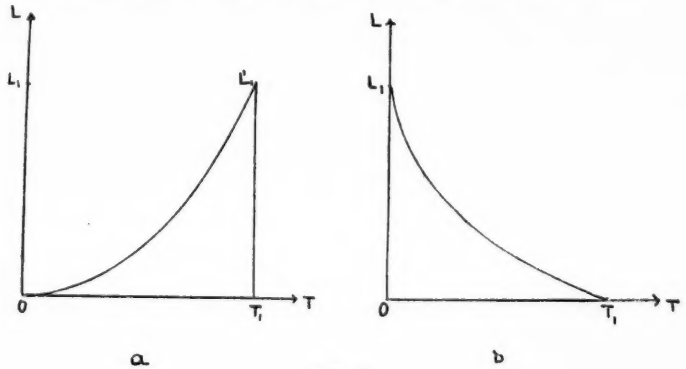

FIG. 1.

If we assume a completely stationary structure of production (*i.e.* if we assume that at every successive moment processes of exactly the same kind are started), we obtain a representation of the different periods for which at any one moment the different units of the total "labour" supply employed in that industry are invested, by simply inverting the first figure, as in Fig. 1 *b*. The difference between the two figures is that in the first case the product T_1L_1' maturing at the moment T_1 is connected with the preceding investment during a period of time of the quantities of "labour" which have contributed to that product, while in the second case the total quantity of "labour" invested in the industry at one moment of time is connected with the stream of output over a period of time which is due to that investment.[1]

[1] In both cases, however, the periods in question are *future* periods of time. In the first case the period OT_1 refers to those future moments of time at which the corresponding quantities of "labour" have to be invested in order to obtain the product at the end of this period, while in the second case it refers to the period during which the product of the labour invested at its beginning, say the present, will mature.

In either of these two forms this curve, which describes the quantities of "labour" invested at successive moments of one process, or the periods for which individual quantities of the total of "labour" employed in the process are invested, represents what I call the investment function ($f(t)$).[1] As will appear later, this two-dimensional method of representing the range of different periods for which the individual units of "labour" are invested is the only adequate representation of what is usually called the period of production or of investment, and cannot usefully be replaced—except by way of a provisional simplification in an early stage of the analysis—by any one-dimensional magnitude such as the "average period of production."

In the preceding diagram the height of the curvilinear triangle measures the quantity of output at a moment of time, and its area (on the assumption of a completely "synchronised," stationary process) the quantity of intermediate products, both *in terms of "labour."* The changes in the quantity of consumers' goods produced which will be the consequence of changes in the investment structure (*i.e.* changes in the shape of the investment function [2]) cannot possibly be represented in the diagram, since from the assumption the total output will (under stationary conditions) always be equal to the total quantity of original factors invested. It should, perhaps, be specially emphasised at this point that the investment function under discussion here as well as the output function to be discussed later are entirely different from the familiar production functions which describe the dependence of the quantity of output on changes in the method of production. The types of functions used here serve merely to *describe* one single process of this sort and cannot by themselves be used to show the effects of changes in the method of production. If this were intended, the quantity of consumers' goods produced by investing a given quantity of "labour" for different ranges of periods would have to be regarded as a functional of the investment function (*i.e.* as $\phi(f(t))$ where the form of the function $f(t)$ is an independent variable). But changes of this magnitude are in a different dimension from those

[1] Strictly interpreted, $f(t)$ is to be taken to correspond to the "inverted" representation of the process (Fig. 1 *b*), while the actual rate at which "labour" is supplied throughout any one process ought to be represented by $f(T_1 - t)$.

[2] In what follows I shall use the terms investment function, investment curve, investment figure and investment structure interchangeably. Occasionally I shall even speak of lengthening or shortening the investment structure as a short way of describing such changes in the shape of the function as involve positive or negative saving.

shown in the first diagram and cannot be represented in it except by introducing a third dimension.

But before we proceed to do this, the limitations of the method of representation so far employed must be pointed out in somewhat greater detail. The diagrams in Fig. 1 show how long we have to wait for the product of the different units of "labour" invested, and, consequently, how long we have to wait for such parts of the product as are to be attributed to individual units of "labour." But it would only be possible to deduce from this how long we have to wait for the different units of consumers' goods if we could assume that equal shares of the total "labour" invested in the course of the process will produce the same quantities of consumers' goods. But there is no reason why we should assume this to be so. Indeed, on the contrary, we know that it cannot be so, since equal quantities of "labour," invested for different periods, must at any given rate of interest necessarily grow into different quantities of products.

But if this is so, if the product of equal quantities of "labour," invested for different periods in the course of any one process, does not consist of equal but of different quantities of consumers' goods, then the investment function which describes how long we have to wait for the product of the different units of "labour" does not directly show us how long we have to wait for the different units of the output.[1] The curve in Fig. 1 *b* in particular, although it shows what part of the quantity of labour invested at the moment O matures during any part of the period OT_1, does not show immediately what quantities of consumers' goods correspond to the former. It is for this reason that it is described as an investment function which is to be clearly distinguished from the output function, which describes the latter phenomenon.

What applies to the final product also applies to the quantity of intermediate products. Without going into this problem at any length, it may be pointed out here that although the area of the investment figure represents the quantity of intermediate products in physical terms (*i.e.* in terms of the quantities of original factors that have gone to produce it), it does not unequivocally determine its quantity in terms of value, either relatively to the value of the factors or relatively to the value of the output.[2]

[1] Misunderstandings on this point, that the traditional concept of the period of production refers to units of factors and not to units of the products, are responsible for many of the objections to the proposition that an increase of capital always means an increase of the period of production.

[2] Without reference to a given rate of interest, the relative area of two investment figures will not even determine in some cases which corresponds to the greater

This magnitude again becomes only determinate when with the introduction of interest we are put in a position to use value as the common denominator to which to reduce the otherwise not comparable physical magnitudes.

III

All these apparently rather complicated relationships can be represented in a fairly simple way if we add to the former diagram, which showed only physical quantities, a third dimension, representing the relative value of these quantities. For this purpose we place the figure so far discussed in the horizontal plane of a three-dimensional system of co-ordinates and measure the values attaching to these quantities along the third (perpendicular) V-axis. It is assumed that the available quantity of "labour," the rate of interest and the value of either a unit of "labour" or a unit of consumers' goods (or, alternatively, the value of both, but not the rate of interest) is given. For the present it is further assumed that one of the many alternatively possible investment functions has been decided upon and that in consequence the quantity of consumers' goods produced is also determined.[1] The problem, then, is what quantity of consumers' goods is to be attributed to individual units of "labour." The answer is contained in the diagrammatic description of equilibrium given by Fig. 2.

In order to simplify the resulting figure at first as much as possible it has been assumed that the investment function is linear. This is expressed by the fact that the hypotenuse OL_1 of the rectangular triangle OL_1T_1 which corresponds to the curve OL_1 in Fig. 1 *a* is a straight line; it means that during the interval of time OT_1 "labour" is invested in that process at a constant rate. Since equal quantities of "labour" must necessarily have the same value, the magnitude of V along any point of OT_1 is necessarily the same, namely equal to OT_0. The value of the total quantity of "labour" invested during the course of the process would be shown by a rectangle with T_1L_1, representing the number of units of "labour," as a base, and OT_0, representing the value of a unit of "labour," as its height. But as it is

quantity of capital in value terms. *E.g.* of two investment figures which have a similar area but of which one is longer with a more, and the other shorter with a less, convex investment curve, at one rate of interest the one and at another the other may correspond to the greater quantity of capital.

[1] The way in which the choice of the investment function will in turn be influenced by the rate of interest and the "productivity function" of the particular line of production (*i.e.* by the function $\phi(f(t))$) will be discussed in Section V of this paper.

assumed that this quantity of " labour " is not all invested at the moment O, but continuously throughout the period OT_1, this rectangle is, as it were, projected into the time dimension and becomes the rectangle $T_0OL_1L_1'$.

The value of any unit of " labour " invested will have to grow, while it remains invested, at the same compound rate of interest. This rate is shown by the curve T_0T_1' and the family of identical curves beginning along T_0L_1', forming together the interest surface $T_0T_1'L_1'$. Since at every point further to the right along OL these curves begin at later moments of time, they will at T_1 have risen

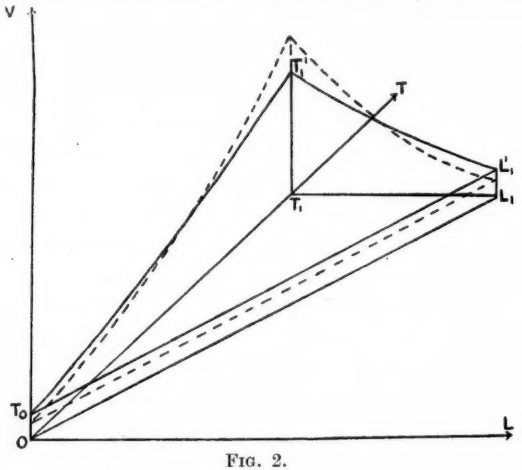

FIG. 2.

for correspondingly shorter periods and have reached a correspondingly smaller height. A perpendicular cross-section at T_1 parallel to VOL will, therefore, cut the interest surface along the curve T_1L_1'. The height of every point on this curve represents the value (and therefore the quantity) of the final products which have to be attributed to the quantity of labour invested at the corresponding point along OL. In the same way at every preceding moment of the interval OT_1 the value of that part of the intermediate products which are the result of an earlier investment of " labour " and are accordingly shown nearer to the left will have grown more in value than the part of the intermediate products existing at the same moment which is the result of later investment and is accordingly shown further to the right. The interest surface will therefore slope upwards not only in the direction of the T-axis but also from the right to the left along the L-axis.

As will be evident from the diagram, the shares of the total product that are to be attributed to the individual units of "labour" invested for different periods of time depend on the rate of interest. A rise of that rate, *e.g.* to the figure indicated by the dotted curves, would have the consequence that relatively larger shares have to be imputed to the units of "labour" invested for longer periods, while smaller shares would have to be attributed to the units of "labour" invested for shorter periods. At the same time the relative value of "labour" and of the product would have to change. If, as has been assumed in the diagram, the value of the product remains constant, the value of "labour" would have to be reduced;

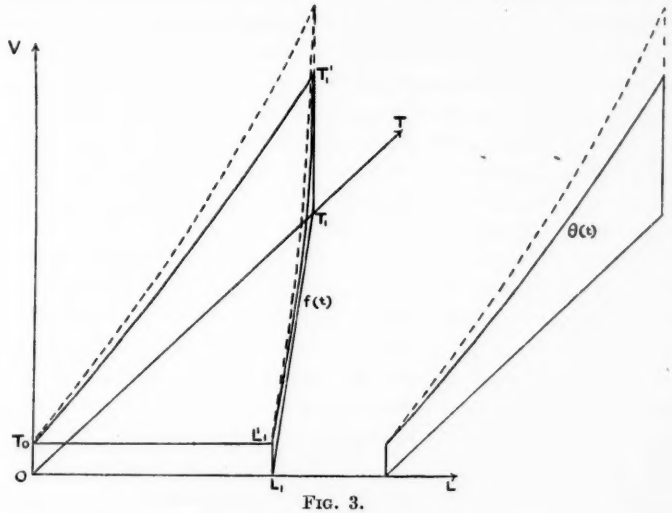

FIG. 3.

while the case where the value of "labour" remained constant would imply a corresponding rise in the value of the product. This situation would be represented in the diagram if the surface indicated by the dotted lines would be lifted by such an amount that the dotted line parallel to T_0L_1' would coincide with that line.

This diagram can easily be adapted to correspond to Fig. 1 *b* instead of Fig. 1 *a*, *i.e.* so as to represent the relationship between the total quantity of "labour" invested at one moment of time in different stages of similar processes, and the output stream derived from it. This form of representation, shown in Fig. 3, has the special advantage of enabling us to derive in a simple way the output function, which will be the starting-point for the discussion in the next section.

In this diagram OL_1 represents the number of units of "labour" invested at the moment O in different stages of the processes going on simultaneously in the industry, and OT_0 the value of a unit of "labour." The unit of "labour" shown at the beginning of the L-axis (*i.e.* nearest to the origin) is being invested in a process which is just being started and its product will accordingly mature only after the lapse of the maximum investment period, *i.e.* at T_1. Units of "labour" shown further on the right of the L-axis are invested in more advanced stages of similar processes and their product will mature at less distant moments, represented by the position of the corresponding points of the line L_1T_1 along the T-axis. This line again corresponds to the curve L_1T_1 in Fig. 1 *b* and represents, therefore, the investment function $f(t)$. But as the value of the product of the different units of "labour" which is shown to mature along this line will have grown at the same compound rate of interest for periods of increasing length, it will be greater as we get nearer to T_1. This increase of the V-co-ordinates corresponding to the products of the different units of "labour" maturing along L_1T_1 is shown by the upward slope of the curve $L_1'T_1'$ above it. It must be remembered here that since all the different units of labour are supposed to be employed in the same kind of process, and therefore to yield the same kind of product, the different value of the product due to the different quantities of "labour" must be due to proportional differences in the quantity of these products. But these different quantities of the product which will result at different moments of time from the "labour" invested at one moment of time represent the magnitude which we have described as the output function.

This magnitude is implicitly given by the shape of the vertical plane $L_1L_1'T_1T_1'$, and depends, therefore, in the same way as this surface on the rate of interest. The area of this plane corresponding to any interval along the T-axis is proportional to the magnitude of the output stream during the respective interval of time. As can easily be seen from the diagram, this area would vary not only in consequence of a change in the height of the curve $L_1'T_1'$, but also in consequence of any change in the direction of the investment curve L_1T_1 which forms its base. The rate of the flow of output at any moment of time will therefore correspond to the first derivative of the investment function $f(t)$ with respect to time, multiplied by the corresponding value of the interest function, *i.e.* the height of the interest surface $T_0T_1'L_1'$. The resulting function, which describes the rate of flow of the output

stream at any moment between O and T_1, is the output function, represented in the diagram by the separate strip marked $\theta(t)$.[1] For the present the essential point is, that this output function can be derived from the investment function only on the assumption of a given rate of interest, and that, as is shown by the part of the diagram drawn in dotted lines, it will change its shape with every change in the rate of interest.

This section may be concluded with a short reference to the meaning of the volume of the three-dimensional body which appears in the last two diagrams. It represents the quantity of capital in value terms under stationary conditions. It shows clearly the reason why only it and not the simple investment figure which forms its base gives an unambiguous expression of this magnitude: because the reinvestment of interest accrued up to any moment of time has to be counted as part of the total investment. It is for this reason, too, that it is impossible to substitute any one-dimensional magnitude like the "average period of production" for the concept of the investment function. For there is no one single average period for which a quantity of factors could be invested with the result that the quantity of capital so created would be the same as if the same quantity of factors had been invested for the range of periods described by a given investment function, whatever the rate of interest. The mean value of these different investment periods which would satisfy this condition would have to be different for every rate of interest.[2]

[1] This strip is to be compared with the other parts of the figure only as regards its shape, but not as regards its absolute height, since it has necessarily to be drawn on a different scale. Its height should become equal to that of the body only where the investment curve becomes parallel to the T-axis. The similarity of the shape of the output function to that of the interest curve in the diagram is due to the fact that the investment function has been assumed to be linear. If this were not so, the output function might assume any other form. The relationship between the shape of the two curves (or the corresponding functions) will be discussed in somewhat greater detail in the next section of this article.

These relationships lend themselves easily to mathematical treatment, but it is not intended to burden the present article with it. Only a short re-statement of the main relationship discussed in the text may be added here. If $f(t)$ be the investment function, $\theta(t)$ the output function, $v = OT_0$ the value dimension of "labour" and ρ the rate of interest per annum computed continuously (Wicksell's *Verzinsungsenergie*), and therefore $ve^{\rho t}$ what in the text has been called the interest function, then $\theta(t) = f'(t)ve^{\rho t}$.

[2] It should be noted that the volume of the body, and therefore the quantity of capital in value terms, will be a finite magnitude even if the investment curve approaches the T-axis only asymptotically. But this is not so important a case as has sometimes been believed, since only expected returns count—or since only economic and not physical duration is relevant. Even a good which is expected to last for ever, like a railway tunnel, will hardly ever be expected to remain permanently useful.

IV

We turn now to the case of durable goods. Here the situation is in many respects the exact reverse of that discussed in the previous section. In the ideal case, where a durable good is created by investing a given quantity of "labour" at a moment of time, and where that good then produces without any further aid from labour a continuous stream of services over a period of time, the primary datum is apparently not of the nature of an investment function but a kind of output function. The given variable is the shape of a flow of services over a period of time. We know how long we have to wait for any unit of these services,

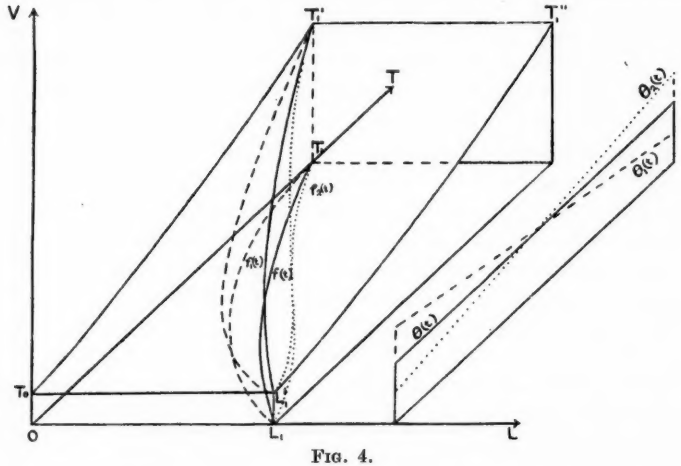

FIG. 4.

but we do not know directly how long we have to wait for the product of the different units of "labour" invested. In order to decide this we should have to know what quantities of the final services have to be attributed to the individual units of "labour." And this can be done only on the basis of a given rate of interest. The relationship can again be described by means of a diagrammatic apparatus similar to that employed in the preceding section.

In Fig. 4 the meaning of the three co-ordinates is the same as in Figs. 2 and 3. The initial data, however, from which we have to start are, (1) the quantity of "labour" invested at zero hour and possessing a definite value, so that the total value of this "labour" can be represented by the rectangle $OT_0L_1'L_1$; (2) the shape of the expected stream of services, represented by the strip marked $\theta(t)$; and (3) a definite rate of interest at which the value

of the " labour " invested at O will increase in time, represented in the diagram by the upward sloping interest surface $T_0T_1'T_1''L_1'$.

Any vertical cross-section connecting the interest surface with the base plane TOL along any line connecting T_1L_1 will represent an output stream which satisfies the condition that the discounted value of the product of each unit of labour invested will be the same. It has, however, to satisfy the further condition that it corresponds to the given time-shape of the output stream, or, if we apply the results of the preceding section, its area within any interval of the T-axis has to correspond to the magnitude of the given output stream within the same interval. The problem, therefore, is to find such a curve in the base plane that the area below the interest surface of a vertical surface erected upon it, differentiated with respect to time, will be equal to that of the output function. This, clearly, is a problem of integration which in the particular case can be solved on the basis of the inverse operation carried out in the preceding section.[1]

It will, however, be sufficient for the present purpose to illustrate by a few examples the relationship between the output function and the investment function in the case of durable goods without going further into the mathematics of the problem. We shall do this by first assuming that the rate of interest is fixed but the shape of the output stream changes, and then by assuming that the rate of interest changes while the output function remains constant.

So far we have only seen (Fig. 3) that if the investment function is to be linear the output function would have to be of a peculiar and rather improbable shape. We shall now start from the more probable assumption that the durable good in question produces during its existence a constant stream of services. What will, on the assumption of a given rate of interest as that represented by the interest surface in Fig. 4, be the shape of the investment function corresponding to such a constant output stream (shown by the line $\theta(t)$ in the diagram)? In geometrical terms this question is equivalent to asking what perpendicular surface, enclosed between the base plane and the interest surface, will have within any interval of the T-axis an area proportional to that of the corresponding part of the given output stream. As the height of this surface will increase with the progress of time, the effect of this increase in height

[1] $f(t) = \int_0^{T_1} \frac{\theta(t)}{ve^{\rho t}}\,dt = \frac{1}{v}\int_0^{T_1} \theta(t)e^{-\rho t}\,dt$

on its area will have to be compensated by a change in another dimension. And the only other change which can have this effect is a change in the inclination of this surface towards the T-axis. The area of such a surface within any given interval will evidently be greater the greater its inclination towards the T-axis, reaching a maximum where it is inclined towards it at 90 degrees, and a minimum where it is parallel to it. It will, therefore, be possible to compensate for an increase in height by decreasing the inclination towards the T-axis, with the effect that the area

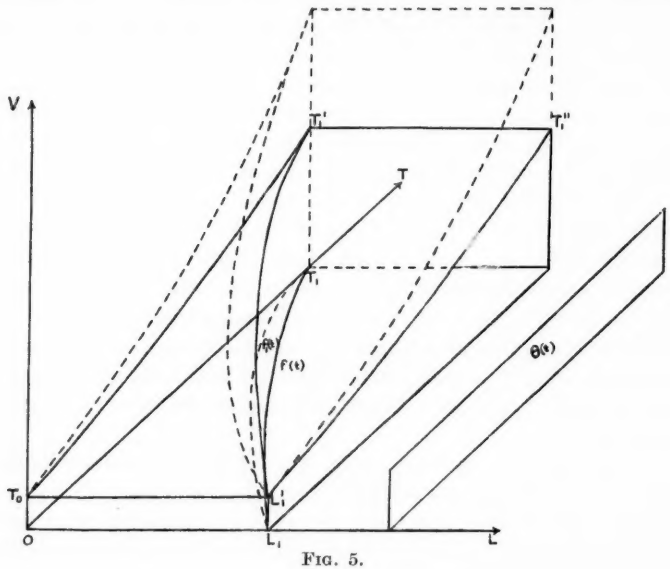

FIG. 5.

of the surface remains the same for any interval of the T-axis. Or, in other words, the answer to our question is that the invest ment curve (the line along which the surface cuts the base plane) will have to be convex towards the T and L axes and will have to increase its curvature as it approaches T_1.

This investment curve, corresponding to the constant output stream $\theta(t)$, is shown in Fig. 4 by the fully-drawn curve marked $f(t)$. It will now probably be evident without further demonstration that if the output stream were not constant but would decrease in time as that marked $\theta_1(t)$ in the diagram, the corresponding investment curve would have to be even more convex towards the origin $(f_1(t))$; while an output function which increased at an arithmetical rate as that marked $\theta_2(t)$ would have

the effect of making the investment function less convex or even, in such parts where it increased faster than the interest curve, concave towards the origin ($f_2(t)$).

It remains now to show the effect of a change of the rate of interest on the shape of the investment function derived from a given output function. This effect is shown, for the case of a constant output stream, in Fig. 5. The fully drawn investment curve marked $f(t)$ corresponds here to the lower rate of interest represented by the surface $T_0T_1'T_1''L_1'$, while the investment curve marked $f_1(t)$ corresponds to the higher rate of interest shown by the second interest surface drawn in dotted lines. In words it means simply that the investment curve will become more convex as the rate of interest rises, and vice versa.

V

What is the economic meaning of the fact that in the first of the two cases discussed the investment function and in the second the output function is the independent variable, while in each case the other one of the two magnitudes is only a derived magnitude, a construction? We can only attempt a very partial answer to this question here, since its complete discussion would raise all the problems connected with the question of how the direction of current investment is determined.

It has occasionally been objected that the investment period, or period of production, is a magnitude which cannot possibly be known to, or play any rôle in the calculations of, the entrepreneur. If this were true this contention would, of course, equally militate against a concept of capital as the discounted value of expected future services as against a definition of capital in terms of (ranges of) investment periods. But surely it cannot be seriously argued that investments are made without some definite anticipation not only of the value of the services expected from them, but also of the time when they will mature. That these expectations will in most cases not be based on certainty but only on a certain chance introduces an element of uncertainty. But it does not alter the fundamental fact that the time when the product is expected to mature is as much a datum for the decision of the entrepreneur as its expected value.

A more serious problem, however, and a problem that cannot be answered generally, is whether this is not only true as regards the total investment in any one process or any one durable good, but also of any single unit of factors invested in such goods or

process. Here the answer in every concrete case depends, in a way familiar from the marginal productivity analysis, on whether it is possible to isolate the physical marginal product of every unit of factors or whether we can only speak of a marginal product in terms of value. This depends, as is well known, upon whether the proportions in which the different factors can be used in any single line of production are variable, or whether only the quantities produced in the different industries, where different but fixed proportions prevail, can be changed.

The case of variable proportions in any one line of production is exemplified in this instance by the possibility of investing parts of the total quantity of " labour " used in any one process for a longer or shorter period. If again we take first the case of goods in process, it will clearly in most cases be possible to change within limits the quantities of " labour " employed in the different " stages " of the process and to compare the additions to the product obtained by employing a given quantity of " labour " in an earlier or later stage of the process. And the condition of equilibrium will evidently be, not that this " marginal product " [1] will be the same for all the units of " labour " employed in different stages, but that its value, discounted over the period for which the respective units of " labour " are invested, will be the same.

Any change in the rate of interest will in consequence change the relative value to be attributed to units of " labour " in the different stages, and, wherever this is possible, give rise to shifts of factors of production between stages. A fall in the rate of interest, *e.g.* will have the effect of increasing the value of the factors in the earlier stages relatively to that in the later stages and create a tendency towards a movement of factors to the earlier stages, until the value of the physical " marginal product " of every unit of " labour " is again equal to the value of that unit *plus* interest for the period for which it has been invested.

But such a physical " marginal product " can be isolated only where the position of individual units of " labour " in the process

[1] This is, of course, not a marginal product in the usual sense of the product of the marginal unit of " labour " employed in the process, but in the special sense in which the term has been used in this connection by Professor Taussig, *i.e.* it is the product of the marginal unit of " labour " employed at any particular stage of production and therefore invested for a definite period of time. Units of labour invested at different stages co-operate with different quantities of capital and the process of discounting is a method of finding their true marginal product by making allowance for the share of the different quantities of capital with which they co-operate, cf. F. W. Taussig, " Outlines of a Theory of Wages," *American Economic Association Quarterly*, Third Series, Vol. XI, 1910.

can be changed while everything else is left the same. And although small changes of this sort will generally be possible, they are by no means possible without limits. Between the one extreme, where any form of investment curve can be changed into any other form by a continuous series of small changes of this sort, involving only the shifts of very small units of "labour," to the other extreme of a few alternative investment curves of altogether different shape, where for technical reasons no small changes are possible, and where a change from the one to the other can only be made by altering the investment period for almost every single unit of "labour," there is an infinite series of intermediate cases, which are more likely to occur in real life than either of the two extremes.

In these cases where only more or less considerable quantities of "labour" which have been invested for different periods can be shifted *en bloc*, it is not possible to single out the physical product of a unit of "labour." The principle on which alone it will here be possible to attribute definite quantities of the product to the different units of "labour" is that the aggregate product of the total labour is so distributed between the individual units, that by discounting the product attributed to every unit, at the rate of interest ruling everywhere else in the system, the value of every unit of "labour" becomes the same. And the further adjustment of the value of the units of "labour" to the level prevailing in the rest of the system will have to be made by increasing or decreasing the quantity of output of the line of production concerned and so influencing the value of the product that is to be discounted.

This, of course, is the familiar principle of imputation of a marginal value product, based on the consideration that if two or more factors are combined in different lines of production in different but fixed proportions, the relative quantities of the product will have to be so adjusted that, by giving the same value to any one unit of the same factor, in all lines of production, we can distribute the total value of the product between the factors. The main application of this to our particular problem is best shown in the extreme case where the investment function is rigidly fixed in all lines of industry: a fall in the rate of interest or an increase in the supply of free capital here will lead to an increase of output in the industries with a longer structure of production (with more capital per head) at the expense of those with a shorter structure of production, and in this way increase the proportion of "labour" that is invested for relatively long periods, thus

changing the investment function for industry in general without changing it for any one industry.

In the case where the investment function is variable by small amounts and where, therefore, it is possible to connect definite amounts of the product with any unit of factors there will always be one and only one output function corresponding to any one investment function, and any change in the rate of interest will lead to changes in both these functions. Where, however, these two functions are not co-ordinated by physical productivity in this unambiguous way, a change in the rate of interest will affect the relationship between the two functions and bring about changes either of the one or the other in different ways.

Now, this case where the shape of the investment function is more or less fixed and every change of the rate of interest simply leads to a change of the relative importance of the parts of the total invested for longer or shorter periods (*i.e.* to a change of the output function) is not very different from the case where the output function is given and the investment function derived from it, *i.e.* the case of durable goods.

In this case it has long been recognised that it is not normally possible to trace a physical connection between every unit of factors invested and the services of the goods due to it, and that therefore the investment period, or investment function, cannot be considered as a technical datum.[1] Only for the marginal units of factors invested in goods of variable durability, *i.e.* for the units that have caused definite extensions of its life, can such a technical connection be established. But this becomes impossible where either the physical durability of the good cannot be varied or where—a very frequent case in real life—its physical duration has for technical reasons to be made greater than its economic usefulness will last (obsolescence). It is therefore in many ways most instructive to discuss the extreme case of a durable good of absolutely fixed duration.

The principle on which for any rate of interest an apparently purely fictitious investment curve can be derived from the output curve has been shown in the preceding section. But is this investment curve purely fictitious? Already the discussion of the effects of changes in the rate of interest have shown that it has some real importance. A lowering of the rate of interest, *e.g.*, which will make the investment curve less curved, means that a greater part of the more distant services of the goods will be

[1] Cf. K. Wicksell, "Realkapital och kapitalränta," *Ekonomisk Tidskrift*, vol. 25, 1923.

attributed to " labour " (because less will be deducted for interest) or that a smaller part of the future stream of services will be sufficient to attract a unit of " labour " to the production of such goods. More goods (or, where possible, more durable goods) of the kind will be produced simply because the more distant part of the expected services will play a greater rôle in the considerations of the entrepreneur and will lead him to invest more on account of these more distant returns. Even a description of the equilibrium between costs and prices is hardly conceivable without a use of the relationships described by the investment function.

But the main importance of the concept of the investment function becomes apparent only when we direct attention to the more dynamic aspects of the question. From what has been said so far it will probably have become sufficiently clear that every rate of interest will direct investment in a definite direction, a lower rate so as to involve a greater total quantity of capital (a " longer " investment structure) and a higher rate so as to involve a smaller quantity of capital. It is, of course, the well-known " function " of interest to limit production to the most profitable methods for which the available quantity of capital is just sufficient. But what exactly this " given quantity of capital " means, and what will be the effects of methods of production that are not in accord with it, this, it seems to me, can only be explained by means of this concept of the investment function.

Under stationary conditions, *i.e.* when the investment function remains constant and all the current income is spent on current output of consumers' goods, their prices and the prices of intermediate products will just cover cost of production. Any lengthening or shortening of the investment structure, however, will necessarily have the effect of temporarily, during the transition period, reducing or increasing output relatively to the level at which it could be permanently maintained. If the investment structure is being lengthened, the output of consumers' goods will for a time be reduced to an amount which has cost less than the total income of all factors of production (including capital); while when it is shortened, an amount which has cost more than this will come on the market. If these changes are the consequence of corresponding changes of expenditure on consumers' goods below or above net income, prices will still correspond to costs. But if they are the consequence of a deflection of the rate of interest from the equilibrium position, output will be either smaller or greater than demand and the consequent disequilibrium between prices and cost will have the tendency to restore

the conditions of equilibrium which the rate of interest has failed to maintain.

These effects, of course, can merely be hinted at in the course of this discussion. But it must be clear, that in this connection the attribution of definite parts of the output stream to such units of factors as are to be considered as its costs is of the greatest importance. It is for the analysis of this process in time and of the effects of changes in the direction of investment on the cost of current output relatively to current expenditure, that the concept of the investment function becomes of real importance. That this is so is not surprising if we remember that what it does is essentially to show how the effects of present activity will be distributed in time, to point to the particular future moments when the results are expected to realise which have led to present investment.

VI

The contention that the chief value of the " period of production " approach lies in the help it renders in the analysis of dynamic phenomena may be a little unexpected, since it has frequently been suggested that while it may be applicable to stationary conditions, it loses all its meaning when applied to problems of economic dynamics. This very widespread impression is due to the fact that the concept of the period of production has generally been interpreted in an historical, backward-looking sense. For this Böhm-Bawerk's manner of exposition is mainly responsible. But, as has been pointed out at the beginning of this article, the essential concept is not that of the length of the process from which current output results, but the range of periods for which the current supply of factors is being invested.

It is true, however, that certain conclusions frequently drawn from the idea of a period of production imply such an historical interpretation. This is particularly true of what might, using a term of J. B. Clark, be called the " synchronisation " proposition, if this is interpreted literally. This proposition states (what is essentially a truism) that under perfectly stationary conditions the stock of intermediate products existing at any one moment of time will exactly correspond to all the different stages through which the " labour " invested at the same moment will have to pass before it matures into consumers' goods. It was on the basis of this proposition that the diagrams used in the first two sections of this paper, which in the first instance were intended to describe a process in time, were also interpreted as a representation

of the stock of capital existing at any one moment. Although this must be true under perfectly stationary conditions, it is just because the concept of stationary conditions implies this that nothing in real life will ever correspond to it; not only because the external data never remain constant, but for the simple reason that the data determining the methods of production are not only "external" data, but include always also results of preceding economic activity. Stationary conditions in this sense could only exist if the productive equipment existing at the beginning of any one period were the same as that existing at the end of that period, *i.e.* if stationary conditions had already existed, or if at any one moment all capital had been available in a free form (a real "subsistence fund" consisting of consumers' goods) and had then been invested in view of conditions which have not changed since. But once unforeseen changes occur after capital has been invested in a definite form, all further investment will be influenced by the historical accident of the existence of certain capital goods, and the movement towards a state of equilibrium will at best be an asymptotic movement.[1]

It is for this reason that the backward-looking interpretation of the "period of production" will always lead to absurd conclusions. A real identity in a physical sense between the stock of intermediate products existing at any one moment and the intermediate products that are being reproduced by the current investment of original factors will never exist. Or, to express the same idea in more familiar terms, it can never be expected that the value of the existing real capital will correspond to its actual cost of production. But all this does not disprove the only essential contention, namely, that the value of the existing capital goods will stand in a definite relationship to the way in which the current factors are being invested. Before dealing with this last problem, it is necessary to say a few words on the way in which unforeseen changes will affect the value of existing capital goods.

This problem would be comparatively simple if all intermediate products were completely specific, *i.e.* if they could not possibly be used for any other purposes or in any other way than was intended when they were made. It is the assumption that such is the case which underlies and justifies most of the over-simplified

[1] "In the order of history labour precedes capital: from land and labour everything proceeds. But in the actual order of things, there is always some capital already produced, which is united with land and labour in the production of new values."—J. Bentham, *Works*, Vol. III, p. 34.

statements on the relationship between the existing stock of capital and current investment. If it were true,[1] the only choice for the entrepreneur in the event of any unexpected change would be between going on as originally intended or abandoning the existing intermediate products entirely. But they could in no way become part of the new processes started after the change has taken place.

Such complete specificity of the intermediate products, however, never exists; and in fact in a great many cases the range of possible uses for any individual capital good is very wide indeed. The effect of this is that any unexpected change will lead to some of the existing intermediate products being used for purposes not originally contemplated and to which they are not perfectly adapted, but for which, once they are in existence, they can now be used with greater advantage than for their original purpose. Their movements between the different stages will be governed by the same general principles as that of the original factors; a fall in the rate of interest will tend [2] to bring about shifts to earlier stages and a rise in the rate of interest to bring about shifts to later stages. In fact, in most respects their position would become similar to that of the "original" factors of production, except that they are not sources of a permanent but only of a very limited stream of productive services.

The degree of mobility of the different intermediate products is, of course, very different and accordingly their value will be affected in very different degrees by any unforeseen change. Although this is one of the most obvious facts, it has an importance for the theory of capital which has very rarely been seen. It is perhaps one of the most urgent needs in the field of the theory of capital, that economists should at last free themselves of the idea that capital is some homogeneous mass, some given quantity of value, which will preserve its magnitude independently of the value of the real commodities of which it consists.

The notion that capital as such—*i.e.* the quantity of value which it represents—is completely mobile and can at will and without any loss of value be transformed in any concrete form,

[1] The proposition that an intermediate product is irrevocably committed to the stage of production for which it was intended implies, among other things, that it is perishable, because keeping it for consumption later than was originally intended would be equivalent to shifting it to an earlier stage.

[2] There will be exceptions from this tendency, since, in some cases, after some of the intermediate products in any stage of production have been shifted to earlier stages, it may be more profitable to use the intermediate products which have remained in a lower stage. The same applies, of course, to original factors where different kinds of such factors co-operate.

has already played much havoc in economic theory.[1] It would be true only if the concrete capital goods were just so many units of homogeneous "energy" which could be put to any use, *i.e.* if they were completely non-specific. But this, of course, corresponds even less to reality than the assumption of complete specificity. It seems reasonable to suppose that *all* the capital goods existing at any one moment are at least partly the result of an historical process which again and again has put existing capital goods to other uses than those for which they were originally intended, and that in consequence the actual form that capital takes will be very different from what it would be if the structure could be built up *ab ovo* with the help of an equivalent fund of free capital.

It was, of course, considerations of this sort which led Marshall to insist on the fact, that existing capital goods (as distinguished from free capital) did not yield interest but quasi-rent, and which made Wicksell describe at least the more durable capital goods as rent-goods (*Rentengüter*). For our main problem, to which we have to return now, it will be useful to think of all real capital as consisting of rent-goods in the extreme sense, *i.e.* as of non-reproducible, non-permanent instruments of production.[2] If it can be shown that even in this extreme case there exists a definite relationship between the value of the existing stock of such goods and the range of periods for which current labour is being invested, this will apply *a fortiori* to the less extreme cases.

The stock of all kinds of such "intermediate products" existing at any one moment represents a stream of future services[3]

[1] An example of reasoning based on this assumption is Böhm-Bawerk's discussion of the effects of a rise of wages on the investment structure, to which Mr. Hill refers in his article already quoted. The apparent contradiction pointed out by Mr. Hill between Böhm-Bawerk's conclusions and those at which I have arrived in a discussion of the same problem (see the article on "Kapitalaufzehrung," *Weltwirtschaftliches Archiv*, July 1932) is simply due to the fact that Böhm-Bawerk assumes complete mobility of capital in this sense, while my analysis is based on the fact that at any moment capital will be definitely committed to particular forms of investment from which it cannot immediately be withdrawn. For a later and more satisfactory analysis of the process of "capital consumption" see J. R. Hicks, *Theory of Wages*, Chapters IX and X.

[2] For reasons which I cannot discuss here, it seems to me advisable to substitute "non-permanent means of production" for the usual "produced means of production" as the essential distinction corresponding to the traditional one between "capital" and "land." The fact that free capital is sometimes used to create means of production which are in a physical sense permanent (tunnels, etc.) creates a certain difficulty which is, however, not likely to become very serious, since even physically permanent intermediate products are rarely expected to remain permanently useful.

[3] Under stationary conditions this stream of services expected from the existing stock of "intermediate products" will be equal to the sum of the still unexhausted parts of all the output streams attributable to the labour invested

which can be pictured by a diagram similar to that shown in Fig. 1 *b*. While almost the total quantity of goods to be consumed in the intermediate future will already be in existence in nearly completed form, the share of the more distant parts of the output stream which will already be provided for by some such products of past labour will become smaller and smaller as we look further to the future. This output stream (or alternatively possible output streams) to be expected from the existing non-permanent goods is the main factor which will determine the direction of the investment of current "labour." If output is to be maintained at a constant level, it will be necessary to distribute "labour" in such a way between the different investment periods as gradually to complete the half-finished products for the future moments and to provide for the replacement of what is used up in such a way that at any future moment there will exist a stock of intermediate products equivalent in productive capacity to that existing now. The wish to maintain the output stream at a certain level will thus make it necessary to invest current labour for definite periods, and the existence of the old stock of non-permanent products will make it possible to do so without temporarily reducing the output stream below the level at which it can permanently be maintained.

It is not possible to attempt at the end of this article a more detailed description of the actual process by which the value and the time structure of the existing stock of rent-goods affect the investment of current labour. Such a discussion would have to include a close examination of the factors which determine the value of existing rent-goods, the rate at which they will be amortised, and the rate of return at which these amortisation quotas can be reinvested. It would be complicated by the fact that the process in question is an essentially dynamic process in the course of which the shape of the investment function for current labour would undergo a gradual change. Some at least of the problems here involved I hope soon to take up in a discussion of the

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at successive moments in the past. But under dynamic conditions, where intermediate products will be used for other purposes than those for which they were originally intended, this strict correspondence between the output function which describes the output stream derived from the quantity of labour invested at a moment of time, and what one might call the integral output function, ceases to exist. This integral output function, which describes the output stream to be derived, not only from the original factors but from all goods existing at any one moment, assumes then an independent significance. It will probably prove to be the most fruitful concept for the analysis of dynamic processes. I understand that it is in this form that the concept of the output function will take a central position in Mr. V. Edelberg's forthcoming publication on these problems.

closely related problem of the meaning of "maintaining capital intact."

It is hoped, however, that what has been said will at least make it plausible that even if there should be no correspondence whatever between the technical composition of the existing stock of real capital and the kind of capital goods in which current labour is invested, yet the value of the existing real capital limits within fairly narrow ranges the time dimension of current investment. It might, in some ways, even have been more fortunate if the connection had been stated in this way, namely, that the existing stock of real capital determines the investment structure of current labour, rather than in the inverse form, although it is, of course, true that it is by changes in this investment structure that changes in the quantity of real capital are brought about.

That anything which will tend to lengthen this investment structure of current labour will lead to increases of the quantity of capital and anything which tends to shorten it will lead to a reduction of capital, remains a point of fundamental importance. But the main point to remember here is that it is not simply changes in the value of the existing capital goods in general, but changes in their relative value, which will cause such changes in the direction of current investment. A rise of the value of those parts which will give their returns in the more distant future will lead to the investment of a greater part of the current labour for longer periods and vice versa. It is the emphasis which the concept of the period of production (investment function) places on this time structure of the stock of real capital, on the fact that it is not a homogeneous mass but that it is organised in a definite way and that the only method by which we can understand this organisation is by concentrating on the place of individual capital goods in this time structure, that constitutes its true usefulness.

F. A. VON HAYEK

THE ELASTICITY OF SUBSTITUTION

1. THERE has recently been developed and discussed by a number of writers—notably Dr. Hicks, Mrs. Robinson and Mr. Kahn—a new concept, which they call the elasticity of substitution. When I first considered this concept it seemed to me that it might prove a valuable tool in the analysis of distribution, and, in setting out to write a chapter on that subject, I expected to make considerable use of it. In the event I have found it of less service than I had anticipated; but in the course of the inquiry some general considerations emerged, which it may perhaps be worth while to set down. In writing this paper I have had the advantage of criticism from Mr. Kahn, who has also very kindly checked over the algebra.

2. The elasticity of substitution in its most fundamental form may be defined as "the proportional change in the ratio of the amounts of the factors (engaged in producing any commodity) divided by the proportional change in the ratio of their marginal physical productivities." [1] This definition, applied to industries, not, as Mrs. Robinson, from whom this wording is taken, applies it, to individual firms, may be expressed symbolically thus. Let a and b be the quantities of any two factors of production A and B—it is immaterial how many factors there are—engaged in producing some commodity, and p_a and p_b their marginal products. When a increases to $(a + \Delta a)$, b becomes $(b + \Delta b)$, p_a becomes $(p_a + \Delta p_a)$ and p_b becomes $(p_b + \Delta p_b)$. The elasticity of substitution, which we may call η, is then equal to $\dfrac{\Delta\dfrac{a}{b}}{\dfrac{a}{b}} \div \dfrac{\Delta\dfrac{p_a}{p_b}}{\dfrac{p_a}{p_b}}$.

Let us write α, β, π_a and π_b for $\dfrac{\Delta a}{a}$, $\dfrac{\Delta b}{b}$, $\dfrac{\Delta p_a}{p_a}$ and $\dfrac{\Delta p_b}{p_b}$. Then by an easy reduction we have, in the limit, $\eta = \dfrac{\alpha - \beta}{\pi_a - \pi_b}$.[2]

[1] Robinson, *The Economics of Imperfect Competition*, p. 330 n., and Kahn, *Review of Economic Studies*, Oct. 1933, p. 72.

[2] The writers who have so far made use of this concept have usually preferred, when treating the matter formally, to define the elasticity of substitution as $-\dfrac{\alpha - \beta}{\pi_a - \pi_b}$. This is a matter of taste. I prefer not to insert the *minus* sign, and shall proceed on that plan in the discussion that follows.

3. This way of defining the concept implies that there is, between any two factors that it relates, a single unambiguous elasticity of substitution, irrespective of the manner in which the initial equilibrium situation is supposed to be disturbed. As will be shown presently, this implication is, in fact, correct in the special case where the relevant productivity function is homogeneous in the first degree—*i.e.* where conditions are such that equi-proportionate changes in the quantities of all the associated factors entail a change in the same proportion in the quantity of output [1]—and where only two factors of production are operating. In the general case, however, it is clear that no implication of this sort holds. When the proportional quantities of any two factors alter in a given measure their proportional marginal productivities will, in general, alter differently according to the nature of the disturbance that has taken place—according as it is brought about by a shift in A's supply function, or in B's or C's or D's. Thus there is not, between any two factors, a single elasticity of substitution, but a large number of such elasticities. As between factors A and B there are elasticities, which we may write ${}_a\eta_{ab}$, ${}_b\eta_{ab}$, ${}_c\eta_{ab}$, and so on, according as the initial equilibrium has been disturbed by a move in A's, B's or C's supply function. Similarly, as between any two factors Q and R, there are a series of elasticities of substitution, which, with a like significance, may be written ${}_a\eta_{qr}$, ${}_b\eta_{qr}$, ${}_c\eta_{qr}$, and so on. Thus, if there are n factors of production there are, in general, $\frac{n^2(n-1)}{2}$ elasticities of substitution. The fact that in the special case of two factors and a homogeneous function of the first degree the two elasticities ${}_a\eta_{ab}$ and ${}_b\eta_{ab}$, which this formula allows, happen to be identical does not, of course, invalidate the rule.

4. Let us now investigate the particular elasticity of substitution ${}_a\eta_{ab}$ in the general case where there is no proviso either that the productivity function is a homogeneous function of the first degree or that there are only two associated factors. It will be enough for our purpose to consider a system containing three factors. The presence of a larger number would extend the algebraic analysis, which is, in any event, cumbrous, without introducing any new point of interest. Write for the productivity function F and for the quantities of the several factors a, b, c:

[1] In a many-firm industry this implies that the marginal physical productivity of any factor to the firm by which it is employed is equal to its marginal productivity to the whole industry, *i.e.* that marginal private and marginal social product coincide.

so that the quantity of product is $F(a, b, c)$. For simplicity of working let us choose units such that $a = b = c$. This, of course, makes no difference to the result reached. For the marginal product of A, namely $\frac{\partial F(a, b, c)}{\partial a}$, write p_a; analogously for the marginal products of B and C. Next distinguish a series of elasticities, to be called *elasticities of partial productivity*. For each factor there is an elasticity of partial productivity in respect of shifts in the supply functions of itself and of each of the others. The elasticity of partial productivity of factor A in respect of B is the proportional change in the marginal productivity of A due to a given proportional change in the quantity of B, when the quantities of all the other factors are unaltered, divided into that proportional change. Thus write $_{a\epsilon a}$ for A's elasticity of partial productivity in respect of changes in A; $_{b\epsilon a}$ for A's elasticity of partial productivity in respect of changes in B; and so on. Then—

$$\frac{1}{{}_{a\epsilon a}} = \frac{a}{p_a} \cdot \frac{\partial p_a}{\partial a}$$

$$\frac{1}{{}_{b\epsilon a}} = \frac{b}{p_a} \cdot \frac{\partial p_a}{\partial b}$$

$$\frac{1}{{}_{c\epsilon a}} = \frac{c}{p_a} \cdot \frac{\partial p_a}{\partial c}$$

$$\frac{1}{{}_{a\epsilon b}} = \frac{a}{p_b} \cdot \frac{\partial p_b}{\partial a}$$

$$\frac{1}{{}_{b\epsilon b}} = \frac{b}{p_b} \cdot \frac{\partial p_b}{\partial b}$$

$$\frac{1}{{}_{c\epsilon b}} = \frac{c}{p_b} \cdot \frac{\partial p_b}{\partial c}$$

while $\frac{1}{{}_{a\epsilon c}}$, $\frac{1}{{}_{b\epsilon c}}$ and $\frac{1}{{}_{c\epsilon c}}$ have corresponding meanings.

Write db and dc for the changes in the quantities of B and C that are brought about when the quantity of A is changed, through a shift in A's supply function, from a to $(a + da)$. Finally write e_a, e_b, e_c for the elasticities of the supply functions of A, B and C. Then the elasticity of substitution between A and B in respect of shifts in A's supply function, namely—

$${}_a\eta_{ab} = \left\{ \frac{\frac{d}{da}\left\{\frac{a}{b}\right\}}{\frac{a}{b}} \div \frac{\frac{d}{da}\left\{\frac{p_a}{p_b}\right\}}{\frac{p_a}{p_b}} \right\} = \frac{p_a b}{p_b a}\left\{\frac{d}{da}\left\{\frac{a}{b}\right\} \div \frac{d}{da}\left\{\frac{p_a}{p_b}\right\}\right\}$$

Hence, by algebraic manipulation, we obtain

$$\frac{1}{a\eta ab} = \left\{\left\{\frac{1}{a\epsilon a} - \frac{1}{a\epsilon b}\right\} + \frac{db}{da}\left\{\frac{1}{b\epsilon a} - \frac{1}{b\epsilon b}\right\} + \frac{dc}{da}\left\{\frac{1}{c\epsilon a} - \frac{1}{c\epsilon b}\right\}\right\} \div \left\{1 - \frac{db}{da}\right\} \quad \text{(I)}$$

5. This formula contains two unknowns, $\frac{db}{da}$ and $\frac{dc}{da}$, and is, therefore, without significance until the values of these have been determined. For that to be possible some assumption must be made about the relation between the rates of payment of the factors B and C and their marginal products. The natural assumption is that the relation is one of equality. If the productivity function is homogeneous in the first degree, and if conditions of perfect competition prevail, this assumption must conform to the facts. The rate of payment of every factor must then be equal to its marginal product. If the condition of homogeneity is not satisfied, it is *impossible* for this to be true of *all* the factors; for payment on that plan would involve aggregate receipts for all the factors together either greater than or less than aggregate output. But that the two factors B and C should be paid in accordance with their marginal productivity is still possible. Let us suppose that they are, in fact, so paid. It follows that, for equilibrium, the marginal product of B must be equal to the supply price of the extant quantity of it; and similarly for C. Hence the change in the marginal productivity of B consequent on the shift in A must be equal to the change in its supply price; and similarly for C.

Hence $$\frac{d}{da}\{p_b\} = \frac{db}{da} \cdot \frac{p_b}{b} \cdot \frac{1}{e_b}.$$

But $$\frac{d}{da}p_b = \frac{\partial}{\partial a}p_b + \frac{db}{da} \cdot \frac{\partial}{\partial b}p_b + \frac{dc}{da} \cdot \frac{\partial}{\partial c}p_b.$$

Hence $$\frac{db}{da} \cdot \frac{1}{e_b} = \frac{1}{a\epsilon b} + \frac{db}{da} \cdot \frac{1}{b\epsilon b} + \frac{dc}{da} \cdot \frac{1}{c\epsilon b}.$$

In like manner, $$\frac{dc}{da} \cdot \frac{1}{e_c} = \frac{1}{a\epsilon c} + \frac{dc}{da} \cdot \frac{1}{c\epsilon c} + \frac{db}{da} \cdot \frac{1}{b\epsilon c}.$$

Writing $\left(\frac{1}{b\epsilon b} - \frac{1}{e_b}\right) = m$ and $\left(\frac{1}{c\epsilon c} - \frac{1}{e_c}\right) = n$, we derive from these equations

$$\frac{db}{da} = \frac{-\frac{1}{a\epsilon b} + \frac{1}{n} \cdot \frac{1}{a\epsilon b} \cdot \frac{1}{a\epsilon c}}{m - \frac{1}{n} \cdot \frac{1}{c\epsilon b} \cdot \frac{1}{b\epsilon c}} \quad \text{(II)}$$

and

$$\frac{dc}{da} = \frac{-\frac{1}{a\epsilon c} + \frac{1}{m} \cdot \frac{1}{b\epsilon c} \cdot \frac{1}{a\epsilon b}}{n - \frac{1}{m} \cdot \frac{1}{b\epsilon c} \cdot \frac{1}{c\epsilon b}} \quad \text{(III)}$$

By substituting the values of $\frac{da}{db}$ and $\frac{dc}{da}$ thus obtained in equation (I) we are able to express $\frac{1}{a\eta_{ab}}$ in terms of e_b, e_c and the various ϵ's. It is not necessary to write out the highly complex expression that results. The essential point is that e_b and e_c, representing the elasticities of supply of B and C, are contained in it.

6. Let us now suppose, not only that the factors B and C are paid in accordance with their marginal products, but also that they are associated in a homogeneous function of the first degree. This condition entails the equality

$$\frac{\partial}{\partial a}\{p_a\} + \frac{b}{a}\cdot\frac{\partial}{\partial b}(p_a) + \frac{c}{a}\cdot\frac{\partial}{\partial c}(p_a) = 0,$$

and its two analogous equations.

For the marginal product of each factor is, with a homogeneous function of the first degree, unaltered by an equal proportional change in the quantities of all of them.

Hence we have

$$\frac{1}{a\epsilon_a} + \frac{1}{b\epsilon_a} + \frac{1}{c\epsilon_a} = 0 \quad . \quad . \quad . \quad . \quad . \quad \text{(IV)}$$

$$\frac{1}{a\epsilon_b} + \frac{1}{b\epsilon_b} + \frac{1}{c\epsilon_b} = 0 \quad . \quad . \quad . \quad . \quad . \quad \text{(V)}$$

$$\frac{1}{a\epsilon_c} + \frac{1}{b\epsilon_c} + \frac{1}{c\epsilon_c} = 0 \quad . \quad . \quad . \quad . \quad . \quad \text{(VI)}$$

No essential simplification is made in the complex final expression for $\frac{1}{a\eta_{ab}}$. In particular the elements e_b and e_c are not eliminated from it. Thus, equally whether or not we assume that the productivity function is homogeneous, the elasticity of substitution between A and B in respect of shifts in A does not measure any characteristic either of the general productivity function or of any supply function, but is a complex consequence of interactions between productivity and supply.

7. The next step takes us to the special case in which there are only two factors of production. If we require the factor B to be paid according to its marginal productivity, but do not require the productivity function to be homogeneous in the first degree, the formula for the elasticity of substitution between A and B in respect of shifts in A's supply function is greatly

simplified. The element $\frac{dc}{da}$, of course, disappears. The element $\frac{db}{da}$ is then derived from the single equation

$$\frac{db}{da}\frac{1}{e_b} = \frac{1}{a\epsilon b} + \frac{db}{da}\frac{1}{b\epsilon b}.$$

Hence

$$\frac{db}{da} = \left\{-\frac{1}{a\epsilon b} \div \left(\frac{1}{b\epsilon b} - \frac{1}{e_b}\right)\right\}$$

Inserting this value in the general equation (I), we obtain

$$\frac{1}{a\eta ab} = \left[\frac{1}{a\epsilon a} - \frac{1}{a\epsilon b} - \left\{\frac{1}{a\epsilon b}\left(\frac{1}{b\epsilon a} - \frac{1}{b\epsilon b}\right) \div \left(\frac{1}{b\epsilon b} - \frac{1}{e_b}\right)\right\}\right] \div \left\{1 + \frac{\frac{1}{a\epsilon b}}{\frac{1}{b\epsilon b} - \frac{1}{e_b}}\right\}$$

$$= \frac{\frac{1}{a\epsilon a}\cdot\frac{1}{b\epsilon b} - \frac{1}{a\epsilon b}\cdot\frac{1}{b\epsilon a} - \frac{1}{e_b}\left\{\frac{1}{a\epsilon a} - \frac{1}{a\epsilon b}\right\}}{\frac{1}{a\epsilon b} + \frac{1}{b\epsilon b} - \frac{1}{e_b}} \quad . \quad . \quad . \quad . \quad . \quad . \quad \text{(VII)}$$

This expression is, of course, very much less cumbrous than that proper to the case of three (or more) factors of production. But, it will be observed, the elasticity of supply of B, namely e_b, is still contained in it.

8. Finally, let us add the condition that the productivity function is a homogeneous function of the first degree. In accordance with what is said in § 6, this entails, when there are only two factors,

$$\frac{1}{a\epsilon a} + \frac{1}{b\epsilon a} = 0 \quad . \quad . \quad . \quad . \quad . \quad . \quad \text{(VIII)}$$

$$\frac{1}{a\epsilon b} + \frac{1}{b\epsilon b} = 0 \quad . \quad . \quad . \quad . \quad . \quad . \quad \text{(IX)}$$

Hereupon the complex formula of the preceding section reduces to the very simple expression :

$$\frac{1}{a\eta ab} = \frac{1}{a\epsilon a} + \frac{1}{b\epsilon b} \quad . \quad . \quad . \quad . \quad . \quad . \quad \text{(X)}$$

an expression which is also obtainable direct from equation (I). The companion expression $\frac{1}{b\eta ab}$ obviously has an identical value. This value, *if the rule of diminishing returns for factors of production is obeyed*, and if my usage of not inserting a *minus* sign is followed, must be negative, since each of $_{a\epsilon a}$ and $_{b\epsilon b}$ is negative. In any event, whether this is so or not, the element

e_b has been eliminated, while the element e_c does not, of course, exist. The elasticity of substitution describes certain characteristics of the productivity function, and is not connected with supply conditions in any way. It is an elementary fact, and not a consequence of a series of complex interactions.

9. Having thus completed our analysis, we have to consider its practical implications. The first of these concerns the special case of two factors only, associated in a productivity function homogeneous in the first degree. If the characteristics of the productivity function which the elasticity of substitution in this case defines can be shown to be relevant to the solution of any important problem, there is excellent reason for disentangling them and giving them a name. This can and has been shown. Thus Dr. Hicks and Mr. Kahn have proved that, when, subject to the above conditions, the quantity of one of two factors is increased, the effect on that factor's proportional share of the product depends on the way in which the magnitude of the elasticity of substitution is related to unity. Again, Dr. Hicks has used the concept—once more, of course, subject to the above conditions—to extend and generalise an important theorem of Marshall's. Marshall, it will be remembered, worked out, in respect of a commodity made up of two elements whose proportions are fixed, *e.g.* knives containing one blade and one handle each, rules relating the elasticity of demand for one element to the elasticity of demand for the whole commodity, the elasticity of supply of the other element and the comparative parts played by the two elements in the total cost. He had also observed, without furnishing formal proof, that these rules are not substantially modified if the commodity is of such a sort that the proportions between the elements are different when different amounts are being produced, *e.g.* if knives made on a large scale always have two blades each.[1] It is easy to see that, when some commodity is being produced by the joint action of a number of factors of production, the factors play a part analogous to that of the elements, handles and blades, in Marshall's case. If, therefore, the proportions between their respective quantities are rigidly fixed, or if, not being fixed, they are functions of the quantity of commodity that is being produced, Marshall's elasticity rules apply. But of course, in fact, when we are dealing with factors of production, and not with elements such as the handles and blades of knives, these conditions are not satisfied. For the proportions in which the several factors are employed

[1] *Principles*: Mathematical Note XV.

will depend in part upon their prices, and, at all events with a commodity that engages large amounts of the factors, these prices will be modified when the output of the commodity is modified. Hence it is important to find, in respect of this more general case, rules corresponding to those which Marshall found in the particular case where the proportions of the constituent elements are independent of their prices. For two factors associated in a productivity function homogeneous in the first degree Dr. Hicks has done this. Write E for the elasticity of demand for the commodity; e for the elasticity of supply of factor B; m for the proportional part of the total cost that consists in payments to A; and λ for the elasticity of demand for factor A. Then, when Marshall's conditions are satisfied, his rules can be expressed in the formula $\lambda = \frac{mEe}{E(1-m)+e}$. Mr. Hicks has shown in effect [1] that, if we write η for the elasticity of substitution between A and B,

$$\lambda = \frac{\eta(E+e)+me(E-\eta)}{E+e-m(E-\eta)}.$$

In Marshall's simple case η is nil: so that, in that case, the generalised formula reduces, as of course it is bound to do, to his formula. Dr. Hicks' result is an important one, and the use of the symbol η enables it to be expressed in a very compact form. A third interesting application of the new concept has been made by Mrs. Robinson. She has shown—again, of course, only for the case of two factors and a productivity function homogeneous in the first degree—that, when the quantity of one factor is increased, the demand price per unit for the existing quantity of the other is increased or diminished according as the elasticity of demand for the commodity is (numerically) larger or smaller than the elasticity of substitution.[2] Thus in the somewhat rarefied atmosphere in which alone it has so far been employed the new concept has fully proved its worth.

10. The second implication of the foregoing analysis is, I

[1] *The Theory of Wages*, p. 244. In this formula, which is translated directly from Dr. Hicks' version, η is defined on his plan as $-\frac{\alpha-\beta}{\pi_a-\pi_b}$, not on my plan, which omits the minus sign.

[2] *The Economics of Imperfect Competition*, p. 259. For these two last applications the elasticity of substitution must be defined as the proportional change in the ratio of the quantities of the two factors divided by the proportional change in the ratio, not of their marginal products, but of their money prices. Provided, however, as is here assumed, that the factors are paid according to their marginal productivities, the elasticity of substitution is obviously the same whether it is defined in the one way or in the other.

suggest, this. For problems, in respect of which the relevant elasticity of substitution is a complex describing characteristics of one or more supply functions interwoven with characteristics of the productivity function, the concept, as so far defined, is of no service. If and when we have expressed the conditions of some event in a formula embodying the elasticity of substitution, we have merely posed our problem in a new form; we have done nothing towards solving it. It may, perhaps, be retorted that, if this consideration condemns the elasticity of substitution as an unsatisfactory tool of analysis, it equally condemns, for example, the elasticities of demand and supply. Formulæ, it may be said, containing these elements, equally with those containing the elasticity of substitution, are only elaborate tautologies. When, for example, we have shown, in terms of the elasticities of demand and supply, the effect of a tax upon the price of a commodity, we have said nothing about the real influences by which that effect is determined. We have merely disentangled the *questions* to which answers are wanted. This, of course, is true. Nevertheless, this sort of disentangling serves a real purpose. The elasticities of demand and of supply are independent elementary economic facts, the general character of whose causation is understood, and which, in some conditions, it may even be possible to measure statistically. A formula that embodies these elements, though not itself realistic knowledge, is a bridge which, if realistic knowledge is to be reached, must be provided and must be crossed. A formula containing the elasticity of substitution, on the other hand, is an *unnecessary* bridge that gives no help. It does not dispense us with crossing the *necessary* bridges; it provides a roundabout way of coming to them. It is no easier to go by the roundabout way than by the direct way; and it takes a longer time.

11. In these circumstances it is open to us either to retain the definition for elasticity of substitution that I have been studying and recognise frankly that the concept is serviceable only in the narrow class of cases discussed in § 9, or to modify the definition in such wise as to exclude the *e*'s *ab initio*. One definition that would accomplish this has been suggested to me privately by Dr. Hicks. Under it $_a\eta_{ab}$ is equal to $\dfrac{\Delta\frac{a}{b}}{\frac{a}{b}} \div \dfrac{\Delta\frac{p_a}{p_b}}{\frac{p_a}{p_b}}$ *when a small amount of A is substituted for B in such a way as to leave the total product unchanged, and the amounts employed*

of other factors, C, D, etc., remain constant. This implies that $\frac{dc}{da} = 0$ and that $\frac{db}{da}$ is such as to make $\frac{d}{da}\{ap_a + bp_b + cp_c\} = 0$. Hence from equation (I)

$$\frac{1}{a\eta ab} = \frac{\left\{\frac{1}{a\epsilon a} - \frac{1}{a\epsilon b}\right\}\left\{p_a \cdot \frac{1}{b\epsilon a} + p_b\left(1 + \frac{1}{b\epsilon b}\right) + p_c \cdot \frac{1}{b\epsilon c}\right\} + \left\{\frac{1}{b\epsilon b} - \frac{1}{b\epsilon a}\right\}\left\{p_a\left(1 + \frac{1}{a\epsilon a}\right) + p_b \cdot \frac{1}{a\epsilon b} + p_c \cdot \frac{1}{a\epsilon c}\right\}}{p_a\left(1 + \frac{1}{a\epsilon a} + \frac{1}{b\epsilon a}\right) + p_b\left(1 + \frac{1}{a\epsilon b} + \frac{1}{b\epsilon b}\right) + p_c\left(\frac{1}{a\epsilon c} + \frac{1}{b\epsilon c}\right)}.$$

The companion expression for $\frac{1}{b\eta ab}$ is obviously identical with this. A much simpler method of extruding the e's is to define $a\eta ab$ as above, substituting for the words there italicised, the words *when a small amount of A is added and the amounts employed of all the other factors, including B, are constant.* This implies that $\frac{dc}{da} = 0$ and also $\frac{db}{da} = 0$. Hence from equation (I) $\frac{1}{a\eta ab} = \left\{\frac{1}{a\epsilon a} - \frac{1}{a\epsilon b}\right\}$. The companion expression for $\frac{1}{b\eta ab}$ is $\left\{\frac{1}{b\epsilon b} - \frac{1}{b\epsilon a}\right\}$. When there are only two factors of production associated in a homogeneous function of the first degree, both the above ways of defining the elasticity of substitution come to the same thing as the way discussed in an earlier section. All the ways make $\frac{1}{a\eta ab}$ and $\frac{1}{b\eta ab}$, both equal to $\left\{\frac{1}{a\epsilon a} + \frac{1}{b\epsilon b}\right\}$. For this case, therefore, any of the definitions may be used indifferently. But for the general case this is not so. Both new definitions have the advantage that they describe characteristics of the productivity function without any intrusions from the side of factor supply. The second is obviously much the simpler of the two. Whether either of them can be turned to a useful purpose in treating the problem of distribution among more than two factors of production remains to be seen. In my own work I have so far found it more convenient to deal with the elasticities of partial productivity individually rather than with combinations of them.

A. C. PIGOU

THE PROBLEM OF MANAGEMENT AND THE SIZE OF FIRMS

THERE have appeared in the last few months two books which require the careful consideration of all who are interested in the study of the structure of industry in its relation to the size of the productive unit. The first of these is Professor Florence's *The Logic of Industrial Organisation;* the second is Part I of the Final Report on the Fourth Census of Production (1930), which gives us for the first time authoritative figures for the size of firms in various British industries, measured by the number of persons employed.

Professor Florence insists that the logic of organisation would require the concentration of production in units of the largest size; that it is only avoidable human failings which result in smaller plants and undertakings.[1] He criticises Professor J. H. Jones [2] and myself [3] for holding the view that the limit to the optimum size of an undertaking is to be found in the increasing costs of co-ordination required for the management of larger units. This view, he says, is exclusively held by economists, and he suggests that the experienced business organiser would take a diametrically opposite view.[4] In support of his argument he

[1] See Florence, *The Logic of Industrial Organisation*, p. 11: "Now that the structure of industry with its firms and plants has been analysed and the various possible references of the 'scale of production' made more definite, we may advance to enunciate a bold proposition. There are logical reasons for supposing that, granting the advantages of mechanical and human specialisation, *large-scale production, especially when conducted in large-scale firms and plants*, results in maximum efficiency." (His italics.) And p. 12: ". . . the more the amount of any commodity that is provided the greater the efficiency."

See also p. 117: "Undoubtedly there are a few men who would be competent to head industrial organisations of almost any size, but if we believe in the normal distribution of inborn abilities, we may assume that such geniuses are rare, and that the average head of the business is not competent to manage unaided on a scale beyond a certain point." And p. 47: "Logically under modern conditions the larger organisations should immediately outdo the presumably less efficient smaller organisation; but in fact there is a lag, owing to the stickiness or 'friction' of the market, *i.e.* the slow adaptation of the consumer, and owing on the production side also to the difficulties in the rapid growth of organisations."

[2] *Economics of Private Enterprise*, pp. 123–4.

[3] *Structure of Competitive Industry*, p. 48.

[4] As regards authority for this view, though research by casual conversation is at best unreliable, my own experience of questioning business organisers is somewhat different from that of Professor Florence. Many, engaged in many industries, and in particular in the cotton, wool and coal industries, and in various

quotes Messrs. Mooney and Reiley [1] to the effect that "the vastest organisation that the human mind can conceive will not be too vast for efficient one-man leadership if the (hierarchical) and functional principles are correctly applied."

With the idea of the economy of the very large unit in mind it is interesting to turn to the Final Report of the Census of Production, and to test these opinions by reference to the facts disclosed there. The statistics relate only to firms [2] employing more than ten work-people in each case, and the present volume covers only the Textile, Leather and Clothing Trades.

	Percentage of Total Workers, employed in Firms employing less than				No. of firms with 200 workers or above.
	50.	100.	200.	300.	
Artificial Silk	3	8	17	22	45
Jute	1	3	12	28	52
Woollen and Worsted	5	14	29	44	323
Hosiery	10	22	40	49	113
Linen and Hemp	5	15	35	49	22
Cotton Spinning	3	10	24	48	362
Cotton Weaving	3	14	38	58	322
Textile Finishing	9	22	43	55	108
Boot and Shoe	10	23	42	56	162
Tailoring and Dressmaking	22	39	56	67	309
Hat and Cap	19	36	61	74	35
Lace	27	51	73	83	14
Saddlery and Harness	34	57	81	100 *	10
Umbrella and Walking-stick	41	63	100 †	100 †	—

* No analysis over 200.
† No analysis over 100.

(*N.B.*—Workers in firms employing less than ten persons are excluded from these figures.)

"fashion industries," have told me that units beyond a certain size were from the point of managerial costs and efficiency less economical.

The most interesting example of this view that I have found in print is contained in some remarks made by Sir Ernest Gowers, Chairman of the Coal Mines Reorganisation Commission, in the course of an address to the Cardiff Business Club (*Colliery Guardian*, March 3rd, 1933). "There must be some optimum size of unit, a size that will secure the admitted benefits of large-scale control without being too big for the control to be efficient. I do not pretend to be able to say categorically what the optimum size is. Colliery owners and managers themselves have very diverse opinions about it. It must, of course, vary in different coal-fields. But what is quite certain is that the optimum is greater than the size of the vast majority of undertakings in the Coal industry to-day. Even on the most modest estimate of the maximum size capable of efficient control, there is plenty of scope for amalgamation for this purpose alone."

[1] See Mooney and Reiley, *Onward Industry*, p. 308.

[2] A precise definition of the "firm" is impossible. The procedure adopted by the Census authorities is described as follows: "Forms were issued in respect of each establishment, but where a firm owning more than one establishment in the same trade preferred to make a single combined return covering all establish-

At one end of the scale of the industries concerned we have the artificial silk and silk trade. Here 66 per cent. of all workers are employed in firms of 750 work-people and above (61 per cent. actually in firms employing above 1,000) and only 8 per cent. in firms employing less than 100 persons. Jute follows next with 32 per cent. of all workers in firms of 750 persons and above and only 3 per cent. in firms with less than 100. We then find a group of industries for which it is approximately true to say that half the workers are in firms greater and half in firms less than 300 workers: hosiery, the cotton trades, the woollen and worsted trade, textile finishing and the boot and shoe trade. There follows the tailoring trade with about half the workers in firms of less than 200 workers, and finally we have the hat and cap trade, the saddlery and harness trade and the umbrella trade with more than half the workers in firms of less than 100 persons. It is evident from the figures that there are wide variations of size of firms both within industrial trades and as between trade and trade. Yet there remains a sense in which we can usefully say that firms in the silk and rayon trades are larger than those in the tailoring and dressmaking trade, and the latter in turn larger than those in the umbrella trade.

We find here fact, as represented by the statistics, in considerable conflict with theory, as represented by Professor Florence's logical organisation. Some explanations of the continued survival of large numbers of firms of small or only moderate size must therefore be provided.

In the course of the many discussions of the survival of the small firm three main types of explanation have emerged. The first, which is chiefly identified with the name of Professor Marshall, may be called briefly the Biological Solution. Marshall, insisting always on the importance of economic biology, found his explanation in the growth and decay of firms.[1] A firm might for a time enjoy economies from expansion and so progressively grow larger. But in time a less quick application of new methods, a less energetic

ments in one area, this course was usually allowed, subject to the number of operatives employed at each establishment being shown separately. On the other hand, where a firm carried on more than one trade in the same establishment, separate returns were obtained for each trade wherever firms were in a position to furnish them. Neither the number of establishments nor the number of returns received therefore necessarily express for any trade the number of firms engaged in that trade. This circumstance should be borne in mind in considering the tables dealing with " Size of firms " which are based on the average number of persons employed as shown in the individual returns." Final Report, Part I, p. xii.

[1] See Marshall, *Principles of Economics* (8th edn.), pp. 286–7, 299–300, 315–17.

management, a less skilful resistance to misfortune would give opportunity for younger and smaller firms to enter and take for themselves part of the former market, even though greater size might have led to a further reduction in the costs of the older firm.

This solution would appear to postulate both a slow maximum rate of expansion and a rapid onset of senile decay. In fact in a growing industry the rate of expansion may be very great. In ten years two motor-car firms have grown from a size close to that of the cotton firms to a size some fifty times as great. Several radio firms have expanded within a similar period to a size some five times greater than that of most textile firms.

It is, of course, true that in older and more stable industries expansion is generally slower, since it must be substitutive rather than additive. The condition of substitution of new plant for old is that total cost with the new plant shall be less than prime cost with the old. The smaller is prime cost as compared with total cost, the nearer must the long period be approached before substitution will take place. But in so far as the economies of large scale may be realised by concentrating the ownership and management of a number of previously separated technical units, growth which is neither purely substitutive nor purely additive is seldom difficult and may be very rapid, as has recently been seen, for example, in the case of the unification of the various road transport services in this country.

Even purely substitutive growth, however, is often so rapid that it is difficult to imagine that in the time that it takes efficiency will be substantially diminished. One would rather expect it to increase, for some time at least, with experience. Woolworth and Marks & Spencer, for instance, have entered a market which, even granted some initial inefficiency based on excessive margins hallowed by traditional practice, is yet fairly severely competitive, and in less than a decade have reached a size greater than almost any of their competitors.

But the chief objection to the biological explanation must be one of fact. The industries in which expansion should be most rapid are those in which the market is most perfect, in which goodwill counts for least. Of all the industries in England in which we should expect expansion to be easiest the cotton and woollen industries are the first. Yet they exhibit more than almost any others the survival of the comparatively small unit. For mechanical reasons the purely technical gains of large scale in these industries are not very great, and expansion by purchase of additional mills would never in recent years have been difficult.

Yet, apart from the various attempts at monopolistic unification, the concentration of small units into moderately large units has made very little progress. It is difficult to believe that this can be accounted for wholly, or even in substantial measure, by the decline of business capacities during the period required for expansion.

The second solution may be called the solution of Imperfect Competition. Fathered originally by Adam Smith, it has enjoyed a great revival in the past few years.[1] Put briefly, the argument is this. Any given market is limited by the density, the wealth, and the tastes of the population within it. The size of the market that can be served by any one firm is thus limited by the density of the market and the area which can be reached at a given transport cost. A firm reaches equilibrium when marginal revenue, as calculated at the works of the firm (and the resultant, therefore, both of density and of transport cost) equals marginal cost also at the works. The level of the marginal revenue will depend, in each case, on the extent to which the firm discriminates within the limits made possible by the transport costs.

But if it were true that the size of the market and the level of transport costs dictated the size of the firm, we should expect firms to locate themselves in such a way that transport costs were at a minimum. We should expect to find each firm (granted a given density of population of uniform wealth and taste, a given level of transport costs, and equal cost in each firm) in the centre of its own hexagonal market, touching six other similar hexagonal markets, and at such distance from the next firm that at the margin for each firm marginal revenue (calculated at the centre) was equal to marginal cost.

We should not expect to find highly localised industries with a number of comparatively small units, such as are to be found in the textile and cutlery trades. For if local economies of raw materials or other external economies required production in one area we should expect to find amalgamation of the small units into large units at these advantageous positions.[2]

The size of the market may be limited also by goodwill. This

[1] For instance, in the work of P. Sraffa, G. F. Shove, E. Chamberlin, R. F. Harrod, Mrs. Robinson. Marshall did not exclude this solution (see, e.g., *Principles*, p. 501), but the central place in his argument is undoubtedly held by the biological explanation.

[2] In this connection it is interesting to remember that in those industries in which transport costs are a large proportion of total costs (iron and steel affords a possible example), very large productive units are as often an indication of a scarcity of natural resources as of a superiority of organising ability. For such

is in practice probably one of the most important limits to expansion. But goodwill is most important in relation to the ignorant purchaser, and far less important in relation to the skilled purchaser. If I wish to buy a good motor oil I must trust to the reputation of a brand. If the Air Ministry wishes to buy oil it can test its suitability by elaborate analysis and offer a higher price only for a better article. We should expect to find imperfections of the market large in close proximity to the ignorant customer, comparatively small in a market where experts are trading and their number is small. We should not, for example, expect a large measure of imperfection in the earlier stages of production in the textile trades, where the unfinished product is sold by experts to experts on an organised market. Moreover, the extent to which goodwill imperfection can limit the size of the firm is itself limited. The difference between marginal cost and average cost can be no greater than the difference between marginal and average revenue, that is to say, the rate of increasing returns must equal the degree of imperfection of the market. Unless the market is highly imperfect the rate of increasing returns at the margin must be small.

Neither of these two solutions offers an entirely adequate explanation of the facts as they exist. There remain two further solutions, which may perhaps be better regarded as variations of a single one. First there is Professor Florence's solution, which I take to be that in an actual, illogical world there is an optimum firm, but that its existence is due only to avoidable incompetence.[1] Second, there is the solution which, I think, Professor Jones, and certainly I myself would offer, that in a perfectly organised world an optimum firm is to be found. I should be prepared to agree that in some circumstances it may be very large indeed; that for some products which are consumed rarely and not in large amounts

scarcity will require production to be concentrated at the few sources of the raw material, and the fact of this local concentration will make possible the amalgamation of the smaller units into larger and technically more efficient units. It has been suggested to me that this may be in part the explanation of the larger productive units in the Iron and Steel trade of the United States as compared with those in England.

[1] It is, of course, impossible to draw a hard and fast line between what I imagine Professor Florence to be saying and what I myself am attempting to say. The limitation to the scale that can be managed arises, even in my view, from the limitations of human abilities, from the fact that they can only think and organise at a certain pace, that they can only crowd so much work into twenty-four hours, that persons take time to convince, and so on. The distinction between us lies in the fact that I should hold that no conceivable improvement of the qualities of human beings, as we know them, could expand the necessary capacities for management indefinitely.

the optimum size might be greater than would be afforded by the whole world market. But I should certainly hold that for every type of product there is in a given state of technique some size at which the technical and other economies of larger scale production are outweighed by the increasing costs of the co-ordination of the larger unit, or by a reduced efficiency of control due to the growth of the unit to be co-ordinated. The point at issue between Professor Florence and myself is whether, in conditions of perfect organisation, management costs will rise as output increases, or managerial efficiency will diminish. It is to that question that I wish now to devote attention.

As Mr. Kaldor has pointed out in a recent article [1] in the ECONOMIC JOURNAL, in conditions of perfectly competitive supply prices of factors of production, increasing cost can only exist for the firm if some factor of production is necessarily a scarce factor from the point of view of the firm, but in perfectly elastic supply from the point of view of all the firms in the industry. This can only happen if for some reason a firm is precluded from increasing the number of units of the factor that it employs, if, that is, it is of the essence of the firm that it employs one unit and one only. The only factor of production which is of this character is the factor of co-ordination. So far as the purely supervisory tasks of management are concerned, Mr. Kaldor has argued, a multiplication of supervision is possible by purchasing more units of supervision or employing them in parallel.[2] But the task of co-ordination cannot be multiplied in parallel. It is of its essence that it is single.[3] Even if the task of co-ordination is exercised by

[1] "The Equilibrium of the Firm," ECONOMIC JOURNAL, March 1934, pp. 60–76.

[2] I find Mr. Kaldor's division into supervisory and co-ordinating tasks of management somewhat difficult. If supervision is limited to the maintenance of discipline and the clerical tasks of securing that production proceeds in accordance with plan, no difficulty arises. But in practice a great part of the activities, even of the lower grades of management, consists in dealing with the minor crises which occur when production for some reason has failed to proceed strictly in accordance with plan, and involves the making of new decisions which require an act of co-ordination with the decisions of other parts of the management. Supervision without co-ordination will be found only in those cases where production could have proceeded almost equally well without supervision.

[3] While it is true (in Mr. Urwick's words) that "the supreme co-ordinating authority must rest somewhere and in some form in every organisation," and that in this sense it is of its essence that it is single, yet (again quoting Mr. Urwick) "there must be co-ordinating authority at lower levels of the chain of responsibility." The act of co-ordination can in a measure be delegated, but the responsibility for the final achievement of co-ordination must be unique. Professor Knight has said, "In organised activity the *crucial* decision is the selection of

a group, the decision of the group must be the decision also of each member of the group, except so far as a member of it renounces his duties of co-ordination and allows another to exercise them on his behalf. If there is division of labour within the co-ordinating group there is no co-ordination. If the British Cabinet allows the Secretary of State for India to make the Cabinet's decisions with regard to India it is a mutual admiration society and not a co-ordinating body.

Now in what does the task of co-ordination consist? It consists in securing that A's decisions do not conflict with B's decisions, or *vice versa*—in denying to some extent, that is, complete liberty of action to A or to B. It consists further in seeing that both A's and B's actions are properly designed to achieve the end that the whole unit has in view, and that they are both approaching this end by paths appropriate to the existing conditions.

The extent to which co-ordination will at any moment be necessary will depend upon the number and the intensity of the factors which can affect the decisions either of A or B with regard to the best means to achieve their own more limited ends, or which can alter the ultimate objective of the whole unit, or alter the appropriate path of the whole unit to this ultimate objective. In a world in which no decisions had ever to be taken a single decision-taking unit could manage an infinitely large undertaking. The actual size of the undertaking which any given unit can manage will depend upon the frequency, the urgency, and the nature of the decisions to be made. It is impossible, therefore, to discuss optimum units for co-ordination without knowing or assuming the type, the degree, and the frequency of change involved.

Mr. Kaldor has argued that, in consequence, "in a full long-period equilibrium (in Marshall's Stationary State) the task of management is reduced to pure 'supervision,'" co-ordinating ability "becomes a free good and the technically optimum size of the individual firm becomes infinite (or indeterminate)." [1]

men to make decisions. . . . Any other sort of decision making or exercise of judgment is automatically reduced to a routine function."

See Urwick, *Management of To-morrow*, pp. 63–4; Knight, *Risk, Uncertainty and Profit* (London School of Economics Reprint), p. 297.

[1] See *loc. cit.*, p. 71. Mr. Kaldor is here following Knight, *loc. cit.*, pp. 267–8. But even in the decisionless world it is doubtful if we should be right in believing that the optimum unit would be infinite. Unless the output demanded from the industry to which the unit is supposed to belong is also infinite, an approach towards infinite size must mean also for the firm an approach through oligopoly towards monopoly, and the unit is likely, therefore, to have supply curves of factors of production which gradually approach to the conditions of the supply of those factors to the industry. A rising supply curve of any one of the factors will be sufficient to set a limit to the optimum size of the unit.

There is obviously a measure of truth in what Mr. Kaldor is here saying. But to secure a decisionless world we must attempt an artificial construction far different from that contemplated by Marshall in his Stationary State. It is not sufficient that "tastes" or "obstacles" shall remain constant. It is necessary that obstacles shall not exist. Even granted perfect foresight the existence of an obstacle needs co-ordinated effort to surmount it. A change of the efficiency of machines, or of the relative efficiency of individuals, or of a crop yield would involve a concerted adaptation to the change. In Mr. Kaldor's world there must be neither sun nor rain, neither snow nor frost, neither thunder nor lightning. There must be a steady consumption of raw materials without any exhaustion of their supplies, a steady progress of firms without such progress bringing either experience to the younger or old age to the elder. Men must not die, and therefore if the state is to be stationary they must not be born. There must be no inventions, no discoveries of new materials or of new sources of supply. No machinery must wear out, for it would be impossible to co-ordinate production during its replacement. In Mr. Kaldor's long period we shall be not only dead but in Nirvana. And the economics of Nirvana, the study of the principles on which decisions should be made in a decisionless world, is surely the most fruitless of sciences.

Now clearly the degree of unreality of Mr. Kaldor's assumptions in what he chooses to regard as long-period equilibrium has nothing to do with the truth of the fundamental issue with which he and I are dealing. Co-ordination is "a dynamic function" in Mr. Kaldor's words, or, as I should prefer to put it, a function of the degree of change, since I myself would conceive of certain kinds of change requiring co-ordination even in a stationary state.

But whatever views we may hold about this, in Marshall's biological long-period equilibrium, where growth is equal to decay, co-ordinating decisions are necessary within one firm even if demand from the point of view of the industry is constant, and in such a world it would be necessary to discuss the types of change and decision which predominate, and the most effective scale on which they can be made.

The most important type of change with which an entrepreneur in his function as co-ordinator of adaptation must deal is a change of demand, and we may take this as an example of a disturbing factor. Given a certain change of demand for the product of an industry, the individual firm has two decisions to make: first, the degree of adaptation that is desirable, second, the method of

adaptation. Now this distinction immediately confronts us with the essential division of all such decisions. Some decisions require the greatest possible knowledge of the detailed operation of the firm itself, others require the greatest possible knowledge of the probable actions of other producers, of the trend of the market for the product or of the supply of one or more factors of production. Decisions regarding the degree of adaptation are best made by persons in close touch with the market, even if comparatively remote from production. The larger the unit for which these decisions are made, in many respects the more accurately can they be made. Decisions regarding the method of adaptation, on the other hand, are made best by persons in intimate touch with the detailed technical problems. But any actual decision will in most circumstances be a compromise between these two types of decisions. For the degree of adaptation cannot be decided without knowledge of the financial effects of given methods of adaptation, and the method of adaptation, particularly in a multiple plant organisation, cannot be determined independently of the degree.

Granted this distinction, we may say that the best scale of management will depend upon the relative importance of accurate knowledge of these two kinds. In an industry in which the methods of adaptation are simple, while the problems of the best degree of adaptation are complex, a large unit may often be controlled even more effectively than a small, and granted a scarcity of entrepreneurs of exceptional ability to estimate the trends of the market, it almost certainly will be better controlled. In an industry in which the most difficult problems are those of technical methods of adaptation, the unit of management will be more efficient when the scale is small enough for the management to be not too remote.[1]

There are some tasks, then, which are best centralised, some which are best decentralised. But there would appear to be in practice no unanimity as to which decisions should be centralised and which decentralised. Mr. Urwick states that in the history of many combines a rhythmic centralisation and decentralisation is to be observed, an excess of the one policy giving way to an excess

[1] The effects of change are not, of course, limited to the structure and amount of management itself. Where change is frequent and rapid adaptation is necessary the size of the unit to be adapted is important. A battalion takes longer to change direction than a squad. It took Ford a year to change over from the Model T to the Model A, whereas Frazer Nash will alter any car to his customer's requirements. The technical optimum, adapted to risks and fluctuations, is, as I have shown elsewhere, always a function of the rate of change. See *Structure of Competitive Industry*, pp. 83 et seq.

of the other policy.[1] In many combines, in fact, centralisation extends little further than price fixing and in some cases order distribution. They are structurally little different from the less formal types of organisation, such as cartels or profit pools. The main unit of co-ordination is the plant, and Mr. Kaldor, if I understand him right, would regard the plant as the firm in this case. A multiplication of plants here yields no economies except in so far as the central office organisation creates conditions nearer to those of perfect competition as regards the distribution of orders to plants and the closing down of plants. Its justification lies not in the realm of costs but of monopoly profits.

An important point emerges here. The division of labour, and the technical gains which are secured by a larger scale of production are bought at the expense of greater co-ordination. If, in an attempt to diminish the degree of centralisation and co-ordination, the unit of production is kept small, the economies of greater technical scale must be forfeited. If it is sought to secure the economies of large-scale technical production, the diseconomies of co-ordination must be incurred. It is impossible to enjoy simultaneously both the technical gains of large scale and the managerial economies of decentralisation.[2]

Decisions regarding methods of adaptation, it has been argued, are best made by those nearest at hand and with the greatest knowledge. But in practice a certain degree of remoteness is dictated by the needs of large scale for technical purposes and for marketing purposes, as well as for the specialisation of the routine functions of management and design. Thus the central problem of management to-day is the facilitation of decisions by persons somewhat remote from the problems which they have to decide. Up to a point an individual or a group can make decisions without difficulty. They can be themselves in touch with the issues that they are deciding. Up to this point in the interests of economy it is at least desirable that entrepreneurs should be occupied. But beyond a point the task of decision-making and of co-ordination has to be specially organised.

It is of the essence of any organisation that it contains the scalar chain of authority [3] through which orders are transmitted

[1] See L. Urwick, *Management of To-morrow*, pp. 73–4.

[2] Where firms which were previously engaged in imperfect competition are amalgamated and the conditions of the market are thereby changed, it may be possible through increased specialisation to secure greater technical economies without greater total costs of co-ordination. But in conditions of perfect competition the optimum degree of specialisation will already have been achieved. Cf. Joan Robinson, *Economics of Imperfect Competition*, pp. 338–9.

[3] See Mooney and Reiley, *Onward Industry*, pp. 31 et seq. The ordinary military, or hierarchical, organisation affords an example of the scalar chain.

to the rank and file of the organisation. But such a scalar chain is itself a bad instrument for the transmission upward of knowledge and of information. It must in almost every case be supplemented by a staff organisation, whether the staff be formally recognised as such or not. The task of the staff is threefold : first to acquire the knowledge necessary to co-ordination and the creation of a central plan of administration, second to interpret the plan of action to those in the scalar chain of authority whose task it is to carry the plan into effect, third to discover at the earliest moment defects in the plan, or divergences from the plan and to secure modification of the plan itself or of its method of interpretation.

Within the staff itself a functional division of labour is possible and frequent, and since the staff must work as a unit, within the staff itself is to be found the scalar chain of authority. But the essential purpose of the staff is to provide for the upward passage of the knowledge on which the one supreme co-ordinating authority can base its decisions.

Messrs. Mooney and Reiley have, as we have seen, argued that granted perfect organisation, a perfect scalar system, and a perfect staff system, an infinite unit can be organised. Before attempting to deal with their main arguments something must be said about the examples with which they support their argument. They show that the largest armies have been organised successfully. But the test of successful organisation of an army is that maximum aggregate productivity is achieved. An army is profitably enlarged and organised up to the point where the marginal net product of the imperfectly organised private is zero. But the test of successful industrial organisation is that maximum average productivity is achieved. An industrial body will be profitably enlarged only up to that point where marginal productivity is equal to average productivity. In the first case the optimum is achieved with heavy increasing costs of co-ordination; in the latter with none or almost none.

Let us now return to the central problem. Can a perfect scalar chain and a perfect staff organise an infinitely large unit without loss of efficiency? The essence of the scalar chain is a hierarchy of persons who beyond a point must know less and less about more and more. The scalar chain can be extended indefinitely without loss of efficiency only on one of two assumptions; first that the necessary knowledge for decisions is very small, second that the maximum amount of co-ordination is achieved at each level in the scale, and the knowledge required for co-ordination at the next higher level need not descend into the lower levels of the scale.

In practice I think that neither of these assumptions is valid in most actual cases. Few would now hold that a knowledge of certain broad principles will enable a man or a group of men to solve the complex problems of modern industry. In almost every instance knowledge of the detail of a problem is an essential condition of its solution. In few cases, on the other hand, is it true that the act of co-ordinating two units can effectively be achieved without knowledge of the internal effects on the units co-ordinated of the methods of co-ordination adopted.

The problem then becomes one of the permissible length of the scalar chain. How many times can the sieve be applied to a stock of knowledge before the remainder ceases to bear any resemblance to the initial stock? Let us take, by way of example, a problem of the coal industry. At the present moment it is perhaps true to say that the House of Commons has become the supreme co-ordinating authority in the coal industry. Through the Coal Mines Act and the Coal Mines Reorganisation Commission it can virtually determine the amount of production and the extent of concentration in the industry. But on what knowledge does it do this? Its decisions are based on the proposals laid before it by Cabinet Ministers. These in their turn have derived their knowledge from a Government department, aided perhaps by a Royal Commission. But few of the members of the Cabinet will have done much more than absorb hurriedly the report of this Commission or a précis of its more practical proposals. The Commission in its turn will have derived its own limited knowledge of the problem from the facts laid before it by a number of mine-owners, members of miners' unions, and representatives of other interests in the industry and outside. The knowledge of the Commission (as distinct, of course, from its power of forming a judgment from a given stock of knowledge) must be vastly inferior to that of its witnesses. But the witnesses themselves are in almost every case one degree at least remote from the practical day by day problems of the industry. Can we say that the ultimate decision is based on adequate knowledge, or in any way a better decision than would be made by a smaller unit with a shorter scalar chain? [1] The larger the field in which co-ordination is being attempted the greater must be the knowledge which ought to be in the minds of the co-ordinators. But man's mind and man's memory is essentially a limited factor. It cannot absorb, understand and retain material without end. One of the

[1] Though the political field offers more obvious examples of the effects of over-centralisation than are readily apparent to the outside observer of the industrial field, yet the difference is, I think, one of degree only and not of kind.

problems of the high official, both in politics and in industry, is to find time for the necessary minimum of reading. No perfection of staff organisation can enable a given unit of co-ordination to co-ordinate an infinitely large unit of operation, whether that staff be of the military or civil service, standing, type, or of the *ad hoc*, Royal Commission, type.

The permissible length of the scalar chain will depend first, as we have seen, on the number and type of decisions to be made and on the knowledge necessary to make them. Second, on the comparative ability of persons at different stages in the scalar chain to make good decisions. If wise men are scarce it may be better to have decisions made on insufficient evidence by wise men than on sufficient evidence by fools. But if we contrast the highly industrialised with the unindustrialised countries we may perhaps feel justified in hoping that industrial problems are very gradually producing men of the ability necessary to handle them, and that the degree of concentration made necessary by a scarcity of able men is little by little being reduced.

There is a third limit to the permissible length of the scalar chain. The crucial decision, as Professor Knight has pointed out in a passage already quoted, is the selection of men to make decisions. The co-ordination of men who are known to the co-ordinator, whose judgments of situations can be estimated, whose temperaments and prejudices allowed for, is a very different task from the co-ordination of men who are but signatures or anonymous figments created in the image of one or two representative individuals. The delegation of the act of co-ordination cannot as a rule be profitably extended beyond the point at which the lowest ranks of co-ordinators can be known to the supreme co-ordinating authority.

Finally, we need to consider the costs of co-ordination. If we accept the view that there is an upper limit, and that not a very high one,[1] to the number of persons who can be co-ordinated by one individual, every increase in size beyond a point must involve a lengthening of the chain of authority, the introduction of a new grade of management. The number of persons concerned may not be large, but they will almost certainly be expensive and they will need a clerical staff to assist them. Thus the larger the unit to be controlled the greater must be the cost of management, unless an increased specialisation can achieve an increased efficiency and a lowered unit cost. At some point the increasing costs of co-ordination must exceed the declining economies in this and other spheres. In fact, as Professor Florence's own figures show,

[1] See Florence, *loc. cit.*, pp. 121–3.

while operative workers increased between 1907 and 1924 only by 10 per cent., administrative, technical and clerical staff increased by some 60 per cent.

But the cost of co-ordination is not limited to the cost of the co-ordinator. Those who suffer co-ordination must almost certainly bear further costs. Apart from the relatively insignificant clerical costs, there are the far more important costs which arise from the time spent by valuable executives in conferences, discussions and committees, in the composition of memoranda and the persuasion of others where the author is already persuaded. In addition to all these are the costs which arise from the loss of initiative and the opportunity to secure without reference to higher authority that the right thing is done at the right moment, or from the relative stagnation which tends to emerge where executives lose hope of convincing higher authority of the necessity for change.

It would appear, therefore, that an optimum firm with an upper limit imposed by the difficulties and costs of co-ordination is both logically satisfactory and a necessary hypothesis to explain the existing facts. It cannot be denied that in a situation where an organisation is tested neither by average productivity, as in industry, nor by aggregate productivity, as in war, the organisation may be almost indefinitely large.[1] That the organisation approaches chaos in such conditions is irrelevant. But granted either the test of war or the test of industry, an organisation has an effective limit. Xerxes discovered it in the one case, Thyssen in the other.

But the optimum is not an optimum independent of the environment in which industry must be conducted. It is dependent obviously upon the development of technique both of production and of management. It is dependent on the rate of interest, and the rate of growth of invention and the consequent obsolescence of plant. It is dependent further upon the conditions of the market; that is, upon the rate of growth of demand and the consequent cost of expansion, and upon the probable variations of demand. All this has for some time been recognised. It is impossible, that is, in any case to regard the optimum firm as one would wish to

[1] It has been suggested to me that, in fact, there is in some cases a considerable interval between the minimum size, dictated by technical considerations, and maximum size, dictated by considerations of co-ordination, that over this range costs are approximately constant, and the size of the optimum is therefore within these limits indeterminate. While such a state of affairs would depend obviously upon the technical circumstances of the industry and the early exhaustion of technical and other economies, such statistical verification as I have been able to secure in the case of one or two industries lends support to this view.

regard it, as a size of firm determined independently of demand, and independently of the environment in which the firm must work. But though it is impossible to regard the optimum firm as wholly independent of a given environment, there are obvious objections to regarding it as the firm best adapted to all the circumstances of the existing environment. For if we do this, every firm which is maximising its profits in a given situation is the optimum firm in that situation.[1] If, as is likely, we are concerned with the probable costs of a firm or group of firms in a situation other than the existing one, it is more convenient to regard the optimum firm as being the firm with the lowest long-period average costs of production, given a market of the dimensions and geographical distribution of the present total market for the products of the industry, given the present variability and rate of growth of the market, and given also the present technical and general environment of the firm and of industry in general. That was the sense in which I myself intended to use the phrase. But the concept is admittedly a fragile one, and the degree to which the hypothetical conditions of competition must be modified to admit of a more perfect adaptation to an environment cannot be accurately stated.

Mr. Kaldor's article has, I think, helped us to appreciate the extent to which the environment in which it must work determines also the optimum scale of co-ordination, and by so doing has made it even clearer than it was before that the optimum firm and the cost curve of the industry must be dependent in this sense also upon the environment in which the firm and industry are working.[2] He has shown that the equilibrium economics of the stationary state has no useful lessons or analogies for the economics of a living world, that the study of an economic system abstracting from its environment is a purposeless academic exercise. We can now profitably return to the proper field of economic studies, the study of the adaptation of economic organisations to their environments, and realise that Marshall was, as so often, right when he said that "the Mecca of the economist lies in economic biology rather than in economic dynamics."

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[1] I think Professor Plant assumed me to attach this meaning to the optimum firm in at least one part of his review of my book in *Economica* (February 1933). Professor Florence, *loc. cit.*, pp. 42–3, would appear on occasion at least to define it thus.

[2] Cf. Shove, ECONOMIC JOURNAL, March 1933, p. 118.

THE RESERVE BANK OF INDIA

THE object of this paper is to describe the principles of the Reserve Bank of India Act, 1934, which received the assent of the Governor-General on March 6, the Bill having been passed by the Legislative Assembly on December 22, 1933, and by the Council of State on February 16, 1934. It is the most important piece of legislation in the history of Indian banking and, as Sir George Schuster, the retiring Finance Minister, said, the outstanding proposal put before the Legislative Assembly during his tenure of office. The Act is a well-balanced measure which takes advantage of the latest experience of other countries. This experience has been adapted with much skill to the special conditions in India.

I

The history of the proposal of an apex or Central Bank for India was discussed in the ECONOMIC JOURNAL of December 1928. It will be remembered that the proposal was by no means a new one. The Royal Commission on Indian Currency and Finance in its Report, 1926, showed that the evidence of witnesses clearly brought out the necessity of a unity of policy in the control of currency and credit if monetary stability is to be achieved. There are great weaknesses in a system where currency and credit are under separate authorities. Sir Henry Strakosch was a member of the Royal Commission, and his influence may be seen in every page of the Report on a Reserve or Central Bank for India. After the lapse of eight years from the publication of the Royal Commission's Report the Act has become a reality. The delay has, all things considered, been very beneficial. The original Bills have been so modified as to produce a very workable plan. India will now have a centralised banking system under which commercial banks will be able when necessity arises to turn into cash the maximum of their assets without disturbance to general conditions. Memories in India are sometimes short, but the history of joint stock bank failures in the last twenty-five years clearly shows how much will be achieved by rediscounting facilities afforded by a central banking system.

It will be recalled that the first Bill was introduced into the Legislative Assembly on January 25, 1927. It was entitled "A

Bill to establish a gold standard currency for British India and constitute a Reserve Bank of India." It embodied in the main the recommendations of the Royal Commission of 1926. It provided for a shareholders' bank free from political influence and a directorate of fifteen members, nine of whom were to be elected by shareholders. The Select Committee altered the Bill very fundamentally by suggesting that the Bank should be a State Bank, the Government of India subscribing all the capital, and the clause prohibiting members of the Central and Local Legislatures from becoming Directors was deleted. This involved a departure from the principles on which the original Bill had been framed and the change was unacceptable to the authorities. On September 8, 1927, Sir Basil Blackett, the Finance Minister, announced that the Government had decided not to proceed further with the consideration of the Bill during that Session. He proceeded to England on October 29 to discuss with the Secretary of State the details of the plan for a Reserve Bank, and on his return a new Bill was published on January 11, 1928. The President of the Assembly declined to allow the Bill a reading, as he held the former Bill was still before the House. This was considered, as it was hoped to amend the Bill through its passage in the Assembly and Council of State. When, however, Government were defeated by one vote in the Assembly over the inelegibility of politicians to be Directors, the discussion on the Bill was adjourned *sine die* on the 10th February, 1928. At this stage the first drops of the thunderstorm of the trade depression occurred and Sir George Schuster succeeded Sir Basil Blackett as Finance Minister. The question of reforms in the Constitution also gave the whole question of a Reserve Bank a new importance. The Government of India in their Despatch dated September 20, 1930, on the Simon Commission's Reform proposals, stated that the formation of a Reserve Bank on sound lines must be a condition precedent to any transfer of financial responsibility from the agents of the British Parliament to a Minister answerable to the Indian Legislature. The Government felt that the statutory obligation of supporting exchange and, therefore, for assuring that adequate remittance can be made to meet all private and public foreign exchange requirements, should not, on grounds of principle, be imposed on Government in the New Constitution.

At this stage an inquiry into banking was undertaken, and this happily had great beneficial results. Inquiries were set on foot in the provinces, and all of the Provincial Committees had begun work by August 1929, except the Punjab Committee,

which began somewhat later. The details of the inquiries were settled by the Central Banking Inquiry Committee, and when these Provincial Committees reported, the Central Committee, with the assistance of a small body of Foreign Banking Experts, set to work, and the Reports of the Central Committee and Foreign Experts were both published in 1931. The Central Committee " consider it to be a matter of supreme importance from the point of view of the development of banking facilities in India, and of her economic advancement generally, that a Central or Reserve Bank should be created at the earliest possible date. The establishment of such a bank would by mobilisation of the banking and currency reserves of India under one authority tend to increase the volume of credit available for trade, industry and agriculture and to mitigate the evils of fluctuating and high charges for the use of such credit caused by seasonal stringency." The Foreign Experts were of opinion that the immediate problem in connection with Indian banking is not a question of expansion but of organisation, consolidation, and co-ordination, and the solution of the main problem was in their opinion a strong, well-equipped and influential Reserve Bank.

The discussions in London at the Round Table Conferences on the new Constitution showed that the question of the Reserve Bank was a *sine qua non* of the handing over of responsibility to a Finance Minister answerable to an Indian Legislature. The Paper Currency and Gold Standard Reserves of the Government of India must be entrusted to a Reserve Bank which would be responsible for monetary stability and at the same time would be free from politics. The Federal Structure Sub-Committee of the First Round Table Conference recommended that " with a view to ensuring confidence in the management of Indian credit and currency, efforts should be made to establish on sure foundations and free from any political influence, as early as may be found possible, a Reserve Bank, which will be entrusted with the management of the currency and exchange." In the course of the discussions of the Third Round Table Conference the Secretary of State for India undertook that representative Indian opinion would be consulted in the preparation of proposals for a Reserve Bank. The new Constitution, as outlined in the " White Paper " published in the early part of 1933, assumes that before the first Federal Ministry comes into being a Reserve Bank, free from political influence, will have been set up by Indian legislation and be successfully operating. Some of the conditions required for the successful working of the Bank depend on world economic

conditions. The Indian budgetary position must be assured, the existing short-term debt in London and in India must be within proper limits, adequate reserves must be accumulated and India's normal export surplus must have been restored. Most of these conditions have been fulfilled. The last, however, has still to be achieved. In accordance with the undertaking of the Secretary of State a Committee on Indian Reserve Bank Legislation (commonly known as the London Committee) met in London in July last year and submitted a Report. The prime purpose of the Report was to facilitate the drafting or rather redrafting of the Reserve Bank Bill. The titular chairman of the Committee was the Secretary of State for India, Sir Samuel Hoare, but Sir Reginald Mant, the deputy Chairman, presided over the Committee, which consisted of 23 members, comprising not only leading authorities on the principles and practice of central banking and financial administrators from India and Great Britain, but also leaders of Indian public opinion, drawn from the Legislature, the business community and public life of British India and the Indian States. A Bill based on the Report of the Committee was introduced in the Assembly and Council of State in September 1933, and a Joint Select Committee of both Houses under the Chairmanship of Sir George Schuster was appointed. The Select Committee did not alter the Bill materially and it was placed before the Assembly in November and passed, as already noted, in December 1933 by the Assembly and by the Council of State in February 1934.

II

The Act is divided into four chapters; the first chapter dealing with definitions, characteristic of most if not all Indian Acts; the second with the incorporation, share capital, management and business of the Bank; the third with central banking functions, and the fourth with general provisions relating to the Reserve fund, auditing, returns and kindred questions. There are five schedules: (1) the areas served by the various share registers; (2) the list of scheduled banks; (3) the provisions to be contained in the agreement between the Reserve Bank and the Imperial Bank of India; (4) the scale of additional dividends payable to shareholders; and (5) the details to be shown in the weekly return. The Bank is a shareholders' bank free from any political influence. The original share capital is 50 millions of rupees divided into shares of one hundred rupees each, fully paid up. Separate registers of shareholders are to be maintained at Bombay, Calcutta,

Delhi, Madras and Rangoon, and a separate issue of shares is to be made in each of the areas served by those registers as defined in the First Schedule, and shares may be transferred from one register to another. No person may be registered as a shareholder in more than one register and he is qualified to be registered in any area where he ordinarily resides or has his principal place of business. A shareholder must be (1) domiciled in India and either an Indian subject of His Majesty or a subject of State in India; (2) a British subject ordinarily resident in India and domiciled in the United Kingdom or in any part of the British Empire the government of which does not discriminate in any way against Indian subjects of His Majesty; or (3) a company registered under the Indian Companies Act, 1913, or a society registered under the Co-operative Societies Act, 1912, or any other law for the time being in force in British India relating to co-operative societies or a scheduled bank, or a corporation or company incorporated by or under an Act of Parliament or any law in force in any part of the British Empire, the government of which does not discriminate in any way against Indian subjects and having a branch in British India. Each shareholder who has been registered for a period of not less than six months will have one vote for every five shares held, but his voting power is subject to a maximum of ten votes. No Director and no member of a Local Board can be a member of the Indian Legislature or of a local legislature unless, within two months of the date of his appointment, nomination or election, he ceases to be such member. No salaried Government official and no salaried official of an Indian State or officer or employee of any bank or director of any bank other than a co-operative bank registered or deemed to be registered under the Co-operative Societies Act, 1912, may be a Director or a member of a Local Board. The Central Board of Directors will consist of a Governor and two Deputy Governors to be appointed by the Governor-General in Council after consideration of the recommendations made by the Board in that behalf; four Directors to be nominated by the Governor-General in Council; eight Directors to be elected by shareholders, two each from the Bombay, Calcutta and Delhi registers and one each from the Madras and Rangoon registers; and one Government official to be nominated by the Governor-General in Council. As regards the four Directors to be nominated by the Governor-General in Council, these are not intended to represent political interests; their purpose is explained in the following extract from the London Committee's report:—"In view . . . of the

fact that in the particular circumstances of India election may fail to secure the representation of some important elements in the economic life of the country, such as agricultural interests, we recommend that a minority of the Board should be nominated . . ., it being understood that this power would be exercised to redress any such deficiencies."

A Deputy Governor and the Government official Director may attend any meeting of the Central Board and take part in its deliberations but may not vote. In the case of a Deputy Governor, however, when the Governor himself is absent, a Deputy Governor may vote if authorised in writing by the Governor. The Directors, whether elected or nominated, are to hold office for five years except the Governor and Deputy Governors, who hold office for a period not exceeding five years and are eligible for reappointment. The Government official Director will hold office during the pleasure of the Governor-General in Council. The elected Director or Directors representing an area on the Central Directorate are elected from the members of the Local Board by shareholders in the area holding five or more shares. In addition to their function in the election of Directors of the Central Board, the Local Boards have no other duties of an executive nature except such as may be delegated by the Central Board. They are, therefore, mainly advisory and will doubtless, as in the case of the discount committees of the Bank of Belgium and the Bank of Japan, play a valuable part in the scrutiny of commercial paper.

The Committee on Indian Reserve Bank Legislation recommended that the first appointment of Directors should be made by the Governor-General in Council, suitable arrangements being made for retirement in rotation. In regard to the Governor the Committee held that it was essential that this officer should command general confidence not only in India but abroad. The majority of the Reserve Bank Committee thought that the Governor-General in his discretion should be the appointing authority when the proposed Indian Constitution Act comes into force. The Reserve Bank Act provides that the first constitution of the Central Board will be as follows :—The first Governor and the Deputy Governors will be appointed by the Governor-General in Council on his own initiative, and the first eight Directors representing the shareholders on the various registers will be nominated by the Governor-General in Council from the areas served by those registers until successors have been elected on the following plan. " On the expiry of each successive period of

twelve months after the nomination of Directors, two Directors shall be elected as prescribed until all the Directors so nominated have been replaced. . . . The register in respect of which the election is to be held shall be selected by lot from among the registers still represented by nominated Directors, and for the purposes of such lot the Madras and Rangoon registers shall be treated as if they comprised one register only."

The Bank's offices will be in Bombay, Calcutta, Delhi, Madras and Rangoon, and a branch in London was decided on by the narrow majority of one vote in the Legislative Assembly. Branches or agencies may be established in any other place in India or, with the previous sanction of the Governor-General in Council, elsewhere. The Bank is thus obliged to establish a branch in London, although it is the usual practice of Central Banks to conduct their operations in another country through the agency of the Central Bank in that country. The South African Reserve Bank, for example, has the Bank of England as its agent in London. There is, however, no reason why the London office of the Indian Reserve Bank should not maintain close contact with the Bank of England while at the same time preserving its independence.

The great principle underlying the structure of India's Reserve Bank is its independence in relation to the State in law and in practice. Reserve banks to perform their functions best must possess a certain detachment and independence of the Government. The principle that the new Bank should be free from any political influence was indeed the rock on which the Reserve Bank Bill of 1928 was shipwrecked. "We have the experience," said Mr. Norman, Governor of the Bank of England, in his evidence before the Royal Commission on Indian Currency and Finance, "in Europe that in the case of the banks in which the Government held considerable measure of control, or there has been a limitation on the freedom of the Bank, it has not resulted to the advantage of the community." The Government of India will indeed stand behind the Bank, but it will not influence it except in the discharge of statutory obligations. It may at first sight appear to be a paradox that in order to carry out a wise central banking policy in harmony with the national life, a State Bank under official control is not advisable. Even in countries where the capital of the Bank is held by the State, steps have had to be taken in certain circumstances to render its administration independent of political influences and of the Government. The Reserve Bank in any country is responsible for the stability of

the currency and on this account alone stands in a special relationship with the Government. Its discount policy affects credit, the country's gold reserves and the general purchasing power. Nevertheless, the independence of the Bank must be safeguarded. This has been done in the Indian Act by precluding the State from subscribing to the capital of the Bank, as is the case with the great majority of Central Banks. The Government will have certain powers in regard to the appointment of the Governor and other Directors of the Bank, especially in the case of the first appointments made under the Act. But this is in no way to give the Government power of interference in the administration of the Bank. It is merely to ensure that the Reserve Bank will be in capable hands. In almost all countries the Governor is appointed by the head of the Government, and in a number of instances other members of the Directorate are so appointed. A Reserve Bank is not a Department of State but rather a large public trust, and the greatest possible care must be taken not to allow sectional interests, even banks themselves, to be represented on the Central Board of Directors. For this reason the shareholders cannot be allowed entirely to elect from shareholders the Board. The limitation of voting power to ten votes prevents undue influence on the Board by those holding large blocks of shares. The profits, too, of the shareholders have to be limited, as the Bank must not be conducted primarily from the viewpoint of dividends, and this limitation prevents the Directors from being unduly influenced by this—the return to be paid on the capital of the Bank. A careful balance has been kept between the various influences likely to bear on the management of the Bank—Government and private. If Government had a controlling influence over the Bank there are ways by which powerful interests in India to-day may try to enforce their wishes. We have in the Bank of France between 1923 and 1925 the influence of extraneous forces on banking policy. Between 1923 and 1925 the Bank exceeded the legal limit of the note issue. In 1925 the volume of notes was 43 milliards although the maximum fixed by law in 1920 was 41 milliards. The balance sheets actually hid this fact owing to Government compulsion, and the increased borrowings from the Bank intensified without any shadow of doubt the depreciation of the franc, and it was one of the causes leading up to the financial crisis of 1926. Excessive governmental influence has been sedulously avoided in the Indian Act, since otherwise Reserve Bank questions might at any moment become first-class political issues, and when politics

comes in at the door central banking is apt to fly out at the window.

III

Next as to the business of the Bank. The Reserve Bank will be essentially the crown of the whole structure of banking in its widest sense. It will exercise a general control and supervision of credit and currency conditions. Its chief functions will be to act as the note-issuing authority, to control credit in the country's interest, and to maintain the stability of the currency, which is the very foundation of all contractual relations. It will act as banker to the Government and to commercial banks. Its business will not be to make profits over and above what is required to pay a moderate limited dividend on the capital employed in it, and it will not be a burden on the taxpayer. Its aim is not that of the commercial banks which collect deposits and make loans to customers and are essentially profit-making institutions. Its great advantage to these banks will be that it will centralise the surplus cash resources of the Indian banking system which can be used in time of need. The Bank is definitely prohibited from engaging in trade or otherwise having a direct interest in any commercial, industrial or other undertaking; purchasing its own shares or the shares of any other bank or of any company or granting loans upon the security of any such shares; advancing money on mortgage or otherwise on the security of immovable property or becoming the owner of immovable property except such as is necessary for its own business premises and residences for its officers and servants; making unsecured loans and advances; drawing or accepting bills payable otherwise than on demand; allowing interest on deposits or current accounts. It has central banking functions, viz. the obligation to be the Government banker and the right to be the sole note-issuing authority in India. It must sell sterling " for immediate delivery in London, at a rate not below one shilling and fivepence and forty-nine sixty-fourths of a penny for a rupee," and buy sterling " for immediate delivery in London, at a rate not higher than one shilling and sixpence and three-sixteenths of a penny for a rupee." Every bank in the Second Schedule of the Act must maintain with the Bank a balance which at the close of business on any day must not be less than 5 per cent. of the demand liabilities and 2 per cent. of the time liabilities. A weekly return is to be sent both to the Bank and to the Governor-General in Council, signed by two responsible officers, showing (*a*) the amounts of its demand and

time liabilities, respectively, in India; (*b*) the total amount held in India in notes; (*c*) the amounts held in rupee coin and subsidiary coin respectively; (*d*) the amounts of advances made and of bills discounted in India; and (*e*) the balance held at the Bank. In return for this the Reserve Bank will discount the paper of the scheduled bank. I consider this section of the Act to be of the very highest importance to the future of indigenous banking, since the provisions are capable of being used to the advantage of the indigenous bankers up and down the countryside. It is, of course, absolutely essential to the control of credit that scheduled banks should keep an adequate and substantial percentage of their demand and time liabilities with the Reserve Bank, and this is a primary reason why the Reserve Bank is debarred from doing ordinary banking business. The Bank has also extensive powers in open-market transactions, a sphere of reserve banking that has much developed in recent years. The Bank, in short, can, when it is considered necessary for the purpose of regulating credit in the interests of Indian commerce, industry and agriculture, discount paper directly in the open market (*i.e.* paper without the signature of a scheduled bank or a provincial co-operative bank), or the Bank can make loans or advances, " provided that a committee of the Board (of Directors) or the Governor shall not, save in cases of special urgency, authorise action under this section without prior consultation with the Central Board, and that in all cases action so authorised shall be reported to the members of the Central Board forthwith." This proviso makes it clear that although the exercise of these powers should not necessarily be regarded as limited to occasions of so urgent a nature as to justify their description as an emergency, they are nevertheless not to be used for the normal operations of the Bank and should be restricted to special occasions. As in the case of the Commonwealth Bank of Australia, the Issue Department is separated from the Banking Department, the model, of course, being the Bank of England. In the case of the Indian Act, however, the proportional method of holding reserves is followed and not a fixed amount of fiduciary issue. The separation of the issue from the banking functions of the Reserve Bank is open to criticism as it does not show the Bank's liabilities as one comprehensive whole. The assets of the Issue Department must consist of not less than two-fifths of gold coin, gold bullion or sterling securities, provided that the amount of gold shall not at any time be less than 400 millions (40 crores) of rupees in value. The remaining three-fifths may be held in rupee coin, Government

of India rupee securities of any maturity and such bills of exchange and promissory notes payable in British India as are eligible for purchase by the Bank, provided that the rupee securities shall not exceed one-fourth of the total amount of the assets or 500 millions (50 crores) of rupees, whichever amount is greater, or, with the previous sanction of the Governor-General in Council, such amount plus a sum of 100 millions (10 crores) of rupees. Gold is to be valued at its par value, 8·47512 grains of fine gold per rupee, rupee coin at its face value, and securities at the market rate. Sterling securities are balances at the credit of the Issue Department with the Bank of England, bills of exchange bearing two or more signatures and drawn on and payable in the United Kingdom and having a maturity not exceeding ninety days, and Government securities of the United Kingdom maturing within five years. For two years after the Act comes into force such securities may be securities maturing after five years. It is further provided that on the date of the transfer of the note issue to the Bank by the Government of India and of the transfer of the Paper Currency and Gold Standard Reserves, the gold coin and bullion and sterling securities shall not be less than one-half of the whole amount transferred and the amount of rupee coin shall not exceed 500 millions (50 crores) of rupees. Any surplus over this amount will be held by Government in a separate account, and arrangements are made by which the Bank and the Government can keep the rupee assets to 500 millions or one-sixth of the total assets, whichever is the greater. As in the case of many other Reserve Bank charters, a tax is leviable during any period in which, with the previous sanction of the Governor-General, the suspension of assets requirements takes place. The periods are naturally for short periods only—not exceeding thirty days in the first instance, which may be extended from time to time by periods not exceeding fifteen days—and the rate of tax shall be "at the bank rate for the time being in force, with an addition of 1 per cent. per annum when such holding exceeds 32½ per cent. of the total amount of the assets, and of a further 1½ per cent. per annum in respect of every further decrease of 2½ per cent. or part of such decrease, provided that the tax shall not in any event be payable at a rate less than 6 per cent. per annum."

In addition to the Central Banking functions just described, the Act carefully prescribes the business which the Bank may transact in regard to accepting deposits without interest, the purchase, sale and rediscount of bills of exchange and promissory notes, making loans and advances, the purchase and sale of

securities, agency business, the borrowing of money, and, "generally, the doing of all such matters and things as may be incidental to or consequential upon the exercise of its powers or the discharge of its duties under this Act." A Reserve Bank should not compete for ordinary banking business with commercial banks, and if it had to pay interest on deposits this would be an additional incentive to make profits and therefore to incur risks which a Reserve Bank should not incur. The prohibition of the payment of interest should be viewed in the same light as the limitation of dividends. National considerations in a Reserve Bank are all-important and not profits. Hence the non-payment of interest has been clearly stated in the Act. Deposits may be taken from "the Secretary of State in Council, the Governor-General in Council, Local Governments, States in India, banks and any other persons." The purchase, sale and rediscount of bills of exchange and promissory notes, bearing two or more good signatures, one of which must be that of a scheduled bank, are clearly defined. To enable the Bank to discount rupee import bills in the event of such instruments coming into existence in the future, the Bank may purchase, sell and rediscount bills of exchange and promissory notes drawn *on* and payable in India if the bills arise out of *bona fide* commercial or trade transactions, have two good signatures, one of which is that of a scheduled bank and mature within ninety days from the date of purchase or discount. The maturity of bills and promissory notes for financing seasonal agricultural operations or the marketing of crops may, as in the United States Federal Reserve system, be nine months from the date of purchase by the Bank. Agricultural trading is longer than that of industry, and for this reason the charters of Hungary, Chile, and South Africa also provide for an extended maturity in such cases. Bills and promissory notes drawn and payable in India and bearing the signature of a scheduled bank, if issued or drawn for the holding or trading in securities of the Government of India or a Local Government or such securities of States in India as may be specified by the Governor-General in Council on the recommendation of the Central Board, have a currency of ninety days.

Among the other principal items of business may be mentioned—(1) the purchase and sale of sterling to scheduled banks; (2) the purchase, sale and rediscount of bills of exchange drawn in or on the United Kingdom with a maturity of not more than ninety days; (3) the making of loans and advances to States in India, local authorities, scheduled banks and provincial

co-operative banks repayable on demand or on the expiry of fixed periods not exceeding ninety days against stocks, funds and securities (other than immovable property) in which a trustee is authorised to invest; gold or silver or documents of title to these; bills of exchange and promissory notes as are eligible for purchase or rediscount by the Bank; promissory notes of any scheduled bank or a provincial co-operative bank supported by documents of title to goods and *bona fide* commercial, trade or agricultural transactions; (4) the making of advances to the Governor-General in Council and to such Local Governments as have the custody and management of their own provincial revenues, the advances being repayable not later than three months from the date of the making of the advance; (5) the purchase and sale of Government securities of the United Kingdom with a maturity within ten years from the date of purchase, and of the Government of India and of a Local Government of any maturity or of a local authority in British India or of such Indian States as the Governor in Council on the recommendation of the Central Board may specify. The amount of securities held in the Banking Department must be so regulated that the total value must not exceed the aggregate amount of the share capital of the Bank, the Reserve Bank and three-fifths of the Banking Department in respect of deposits, the value of securities maturing after one year must not exceed the aggregate of the share capital, the Reserve Fund, and two-fifths of the Banking Department in respect of deposits, and the value of securities maturing after ten years must not exceed the aggregate of the share capital, the Reserve Fund and one-fifth of the liabilities of the Banking Department in respect of deposits. These limits are to be regarded as maxima and in ordinary circumstances the Bank will keep its security holdings as liquid as possible and will operate well below these limits; (6) the borrowing of money for a period not exceeding one month and the giving of security for such borrowed funds. No money may be borrowed from any person in India other than a scheduled bank and only from a Reserve Bank abroad. It is also provided that the total borrowings in India must not exceed at any time the amount of the share capital of the Bank.

IV

It remains to discuss very briefly the general provisions of the Act and also the Schedules. These provisions are concerned chiefly with the Reserve Fund, the dividend on the capital, the

exemption of the Bank from income and super-tax, auditors, returns and reports, and the creation of an agricultural credit department, the last of which was put forward in the Legislative Assembly and accepted on behalf of the Government by Sir George Schuster. The Reserve Fund is to be created by the transfer to the Bank of rupee securities of the value of 50 million rupees (5 crores) from the Governor-General in Council. The Reserve Fund will, therefore, be the equivalent of the paid-up capital of the Bank. The maintenance of adequate Reserves is essential in the case of a Reserve Bank as it gives protection against the effects of any depreciation in the value of assets and promotes confidence in the solidity of the banking system. The charters of many Central Banks give special attention to the accumulation of Reserve funds after the payment of an adequate return on the shareholders' capital. As in the U.S. Federal Reserve system, a 5 per cent. cumulative dividend is provided for and the maximum that can be paid is of the order of 6 per cent. " After making provision for bad and doubtful debts, depreciation in assets, contributions to staff and superannuation funds, and such other contingencies as are usually provided for by bankers, and after payment out of the net annual profits of a cumulative dividend at such rate not exceeding 5 per cent. per annum on the Share capital as the Governor-General in Council may fix at the time of the issue of shares, a portion of the surplus shall be allocated to the payment of an additional dividend to the shareholders calculated on the scale set forth in the Fourth Schedule, and the balance of the surplus shall be paid to the Governor-General in Council provided that if at any time the Reserve Fund is less than the share capital, not less than 50 lakhs of rupees (Rs. 5,000,000) of the surplus, or the whole of the surplus if less than that amount, shall be allocated to the Reserve Fund." It is clear that, while the Government may appear to be handing over a profitable enterprise to private shareholders, the latter are not really presented with the profits of the paper currency and the gold standard reserves, since they subscribe the Bank's capital, and the Act fixes 6 per cent. as the maximum dividend thereon, and since all surplus profits will still go to Government. The 1928 Bill fixed the maximum at 7 per cent. In fixing this maximum dividend under the Act two things were considered, viz. (1) the yield on Government long-term securities, and (2) the necessity of attracting the small investor and thus securing a wide distribution of the shares of the Bank. The rate of fixed (minimum) dividend will be decided on at the time of issue of the

shares, and must depend to some extent at least on the rate on comparable securities at that time. The South African Reserve Bank was the prototype of the Indian Reserve Bank in regard to this, and indeed also but to a less extent the U.S. Federal Reserve system. The South African Reserve Bank provides for a cumulative dividend of 6 per cent. which may reach the maximum of 10 per cent. Any surplus under the South African Act that remains in any year after the Reserve equals the paid-up capital of the Bank and after providing a 10 per cent. dividend to the shareholders, goes to the Government. In addition to the appointment of not less than two auditors the Act provides that the Governor-General in Council may at any time appoint the Auditor-General or such auditors as he thinks fit to examine and report upon the accounts of the Bank. The Bank must create a special Agricultural Credit Department, the functions of which are merely (1) to maintain an expert staff to study all questions of agricultural credit and to be available for consultation by the Government, Local Governments, provincial co-operative banks and other banking organisations; (2) to co-ordinate the operations of the Bank in connection with agricultural credit and its relations with provincial co-operative banks and any other banks or organisations engaged in agricultural credit. The educative effect of the Banking Inquiry 1929–1931, perhaps its greatest value, is seen in the clause that within three years the Bank must submit a report to the Governor-General in Council on the extension of the provisions of the Act relating to scheduled banks to persons and firms, not being scheduled banks, engaged in British India in banking and on the improvement of the machinery for dealing with agricultural finance and methods for effecting a closer connection between agricultural enterprise and the operations of the Bank. By far the most valuable part of the Banking Inquiry investigations were those relating to rural finance, especially the problem of rural indebtedness and the establishment of a link between agricultural industry and the money market, between the farmer requiring credit and the capitalist seeking investment. The clauses of the Indian Reserve Bank Act on scheduled banks contain germs which may affect in no small degree the whole future of Indian banking and indeed the prosperity of Indian agriculture.

It can hardly be expected that the existing banks in India will welcome universally the creation of the Reserve Bank. But in a few years' time the Reserve Bank should be able to dissipate any feeling of suspicion or lack of understanding in regard to central banking functions. Its privileged position as the Govern-

ment banker and the bankers' banker, its exclusive right of note issue, its use of the Government balances, its ability to compete on rare occasions should the necessity arise with the commercial banks in order to control the credit situation, are bound to engender in the early stages some uncertainty on the part of the commercial banks. If, as is certain, men of first-rate ability in central banking are appointed to the key positions of the Bank, any feeling of antagonism is bound to disappear. The transfer of the Government balances from the Imperial Bank of India to the Reserve Bank will be done in such a way as to avoid any disturbance to the banking machinery of the country. The Agreement between the Reserve Bank and the Imperial Bank provided in the Act and the recent amending Act of the Imperial Bank of India are not in any way ungenerous to the Imperial Bank, which will now be freed from the necessary restrictions imposed when it held the Government balances. The Agreement is for fifteen years, and the Imperial Bank is to be the sole agent of the Reserve Bank at all places in British India where there is a branch of the Imperial Bank in existence at the time when the Reserve Bank Act, 1934, comes into operation and where there is no branch of the banking department of the Reserve Bank. The Reserve Bank is to pay to the Imperial Bank for the first ten years a Commission calculated at one-sixteenth of 1 per cent. on the first Rs. 2500 million (Rs. 250 crores) and one thirty-second of 1 per cent. on the remainder of the total of the receipts and disbursements dealt with annually on account of Government by the Imperial Bank of India. At the end of ten years these payments to the Imperial Bank will be revised and for the next five years will be determined by auditors on the actual cost to the Imperial Bank. This arrangement will be revised at the end of every five years so long as the Agreement remains in force. In addition to this and in consideration of the Imperial Bank of India's having branches not less in number than those existing at the commencement of the Act, the Reserve Bank must pay to the Imperial Bank annually for the first five years of the fifteen-year period nine lakhs of rupees (£67,500), six lakhs (£45,000) for the next five years, and four lakhs (£30,000) for the next five. The Imperial Bank, on the other hand, cannot without the approval of the Reserve Bank of India, open any branch in substitution for a branch existing at the time when the Act comes into force without the approval of the Reserve Bank.

It is not yet possible to fix a date when the Act will come into force. In recent years the credit of India has stood high and her reserves are so strong that, as Sir George Schuster pointed out in

the Legislative Assembly on September 11, 1933, the Bank could be started in accordance with the proportion of the Assets fixed by the Act immediately. Treasury balances in London are strong and, moreover, since the gold was valued at the old parity there is a hidden reserve of unrealised profit of 220 million rupees (Rs. 22 crores) on the gold holding at market prices. It may be safely said that in the last two years the Indian budgetary position, so far as the Central budget is concerned, has been sounder than that of almost any other country. The existing short-term debt, both in India and in London, has been substantially reduced, adequate reserves have been accumulated, but the normal export surplus in merchandise has not yet been achieved. All things considered, conditions are far more favourable to the establishment of the Reserve Bank than hitherto.

The passing of the Reserve Bank Act is, as we have seen, the most important piece of legislation in the history of Indian banking. It paves the way for the new Constitution. It has been accepted in all the Constitutional discussions and established by the experience of all countries, that when public finance rests with a Ministry responsible to an elected Legislature and liable to frequent change, the control of a country's credit and currency should be with an independent authority acting with continuity. This authority is a Reserve Bank independent of political control. In the new Constitution financial responsibility will be transferred, and the White Paper has rightly made it a condition of such transfer that an independent Reserve Bank should be in actual operation before the Constitution comes into being.

The scheme for a Reserve Bank has been brought to a successful issue only after many vicissitudes extending over the past seven or eight years. In 1927 in particular there was a real danger that the Reserve Bank car might after all be shunted on to political lines. This would have been fatal to the whole scheme. Happily the symptoms of weakness that tended to compromise on this vital issue were successfully resisted. Subsequently the main danger has been the possibility of a deterioration in the Indian financial position during the unhappy period of the world crisis which began in 1929. This has been averted by the consistent policy of the Government, which during a period covering six budgets has always stood for budget balance and strict control of capital expenditure.

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REVIEWS

The Art of Central Banking. By R. G. HAWTREY. (Longmans, Green & Co. Pp. xii + 464. 18*s*.)

MR. HAWTREY has named this volume *The Art of Central Banking*, as the essay with this title is the most substantial contribution in the book. The other essays comprise a closely reasoned criticism of Mr. Keynes's *Treatise on Money*, and cover such topics as French monetary policy up to 1932, the American Stock Exchange boom and its collapse in 1929, International short-term investment and Remedies for unemployment. While the range of subjects discussed is thus extensive, the book has a unity based on the central theme of the monetary question as the dominant factor in the trade cycle. An advantage of bringing together in one volume a survey of post-war developments in this country, France and the United States is that the action of the monetary authorities in each country is studied in relation to the guiding motive of the work, and the practical conception of the duties of a Central Bank is tested in the light of experience.

In this review it is proposed to concentrate primarily on the principal essay, "The Art of Central Banking." Mr. Hawtrey begins with an historical survey explaining how the Bank of England in the course of the last century gradually assumed the responsibilities attaching to "the lender of last resort." The story of the familiar crises of 1847, 1857 and 1866 is passed in review and the services performed by Goschen and Bagehot in establishing the responsibilities of the Bank of England as the ultimate bulwark of the London money market are recognised. The more important part of the essay deals, however, with the events that followed the report of the Cunliffe Committee of 1918 which provided the basis of the re-establishment of the gold standard in this country in 1925. The art of Central Banking, in the sense conceived by Mr. Hawtrey, is elucidated by an exposition of the proceedings of the Central Banks of the leading monetary centres after the War, associated with criticism, sometimes in trenchant terms, of the errors that they are deemed to have made. Mr. Hawtrey's view, summed up in his own language, is that "the result has been not merely that the world has been insufficiently prepared to deal with the new problems of Central Banking which have arisen in the

years since the War, but that it has failed even to attain the standard of wisdom and foresight that prevailed in the nineteenth century." These words contain a serious charge, and if the charge is justified the gravity of the economic crisis under which the world as a whole has laboured for the last five years certainly demands a restatement of Central Banking theory and the application of new methods. In his essay on Mr. Keynes's treatise on money Mr. Hawtrey states, "I regard the credit cycle as essentially a periodical fluctuation in the world value of gold," that is to say, the essential factor in the trade cycle is the price factor, seeing that prices under an international gold standard are ultimately expressed in terms of gold. The fundamental fact in a period of trade depression is the disequilibrium between prices and costs, in which Mr. Hawtrey stresses the predominant importance of wages, between the prices of agricultural and industrial products and between incomes and debts. The Central Bank, by its regulation of credit, is in a position to enlarge or contract consumers' income (the total of all incomes expressed in terms of money) and consumers' outlay (the total of all disbursements out of income), and the failure to regulate consumers' income and outlay correctly leads, on the side of excess, to inflation and, on the side of deficiency, to deflation. The monetary authorities "must endeavour so to adjust their measures that the resultant enlargement or compression of the consumers' income and outlay will be just what is required." Mr. Hawtrey thus presents the trade cycle as a problem in monetary science and the recent havoc as the measure of the world's failure to solve the problem.

Where has the failure been? It is fashionable in these days to abuse the financial authorities for the failure of the monetary system to harmonise debts with the capacity to pay or consumption with production, but few writers have made the effort, which is such a conspicuous feature of Mr. Hawtrey's work, to bring the criticism home in concrete manner. Though Mr. Hawtrey's criticisms of Central bankers are vigorous, he is, as is well known from his other works, in no sense allied to those who consider that an international gold standard cannot be worked so as to ensure the full employment of national resources in men and material in so far as these matters lie within the sphere of monetary policy; for while stressing the monetary aspect of the economic problem Mr. Hawtrey would doubtless readily recognise the serious complications that may be introduced by misguided political or commercial policies. He regards the results of the Genoa Conference in 1922 as marking an epoch in the evolution of the art of Central

Banking " in that for the first time they establish the responsibility of the Central Banks for the value of gold." He emphasises the point that for a substantial period, ending in 1929, the Federal Reserve authorities successfully handled the internal credit situation in a manner that avoided any serious fluctuations in the price level. When symptoms of price decline and depression showed themselves, " measures of credit relaxation quickly dispelled them." Mr. Hawtrey considers that the death of Governor Benjamin Strong in the autumn of 1928 proved a disaster to the world in that his policy of price regulation was abandoned. There must, of course, remain the moot question as to how Governor Strong would have handled the later stages of the Stock Exchange boom in New York which was the prelude to the collapse in the autumn of 1929. In his essay on " Speculation in Wall Street " Mr. Hawtrey indicates that Central Banks have only a limited concern with speculation as a possible cause of inflation, and it is to be presumed that his test of inflation would be an undue rise in prices associated with wage troubles and industrial discontent. From this point of view Mr. Hawtrey argues that there was no inflation of this kind discernible in the United States in 1929. The Federal Reserve Board's restrictive actions had sufficed and they were not otherwise concerned with the speculation bubble, which was in any case bound to burst sooner or later. The late Mr. Paul Warburg, however, took the view that the incipient boom should have been scotched at an earlier stage by credit restriction, and his view on this point may prove of interest in connection with other developments which are taking place at the present time. Mr. Hawtrey acquits the Federal Reserve Banks of having done anything improper up to July 1929, and goes so far as to say that even up to September 1929 " the speculative fever was continuing and a relaxation of credit might still have caused inflation." The real gravamen of his charge against the Federal Reserve authorities is that they hesitated to lower rates and relax credit after the crisis of October 1929 had broken out.

Mr. Hawtrey seeks to appraise French banking policy in regard to the economic crisis. The restrictions on the power of the Bank of France to take the initiative in open-market operations naturally do not meet with his approval, and opinion in this country would in general concur. The drain of gold to France after the post-war stabilisation of the franc is recognised as having been inconvenient owing to the influence that this had on Central Banking policy in other international centres. Mr. Hawtrey, however, holds that " while the French absorption

of gold in the period from January 1929 to May 1931 was, in fact, one of the most powerful causes of the world depression, that is only because it was allowed to react to an unnecessary degree upon the monetary policy of other countries."

"While France was to blame for absorbing gold and the United States for not parting with gold, it was through England that the process of credit restriction, by means of which the scarcity of gold brought about the compression of the consumers' income throughout the gold-using world, took effect." Mr. Hawtrey is, in fact, at some pains to emphasise the peculiar responsibility of London in the matter of the world crisis and some vigorous shafts are directed at the Bank of England in the process of his argument. For example, he criticises keenly the delay in reducing bank rate in 1929–30, when six months elapsed in the process of reducing the rate from $6\frac{1}{2}$ per cent. to 3 per cent. Again, he criticises the adoption of a restrictive policy in an effort to avert the breakdown of the gold standard in 1931, holding that the only measure which offered any prospect of doing so was a vigorous policy of expansion based on extensive open-market operations.

While different views may be taken regarding the duties of Central Banks in the face of a domestic crisis consequent on a Stock Exchange boom, and while opinions will differ to the end of time regarding the degree of responsibility attaching to the various monetary centres for the crisis, readers of this book will be grateful to Mr. Hawtrey for his careful exposition of the basic factors on which judgments must be formed and for his precise and stimulating criticisms. Sometimes, as for example when he censures the constitution of the Bank of England from the point of view of its competence to handle the credit question, Mr. Hawtrey may convey the impression that the theoretic position which he maintains with much forceful argument is inadequately appreciated. Some may hold that his analysis of the crisis, in so far as it is a monetary phenomenon, does not lead to a just apportionment of blame as between London and New York, and it might well be urged that London, by its effort to work the gold standard even in difficult times on a relatively small base of gold, was, in fact, treading an enlightened path and exhibiting a valuable example.

More recent events must, however, have given Mr. Hawtrey firmer ground for hoping that the wreckage of the post-1929 period will not have failed to teach the world some valuable lessons in the art of Central Banking. Among the documents produced by the Monetary and Economic Conference in July 1933 is a series of resolutions bearing on the general principles of Central Banking

policy. Agreement on these resolutions, of which more may be heard hereafter, was reached by all the Governments represented on the sub-Committee on Technical Monetary Problems except that of the United States of America, which considered discussion of the question premature. Space permits the citation of only the most important in this connection of these resolutions:

> "Since . . . the proper functioning of the gold standard requires in the first place the adoption by each individual Central Bank of a policy designed to maintain a fundamental equilibrium in the balance of payments of its country, the discretion of each Central Bank in regulating the working of the gold standard in its own country should remain unimpaired. Central Banks should, however, recognise that in addition to their national task they have also to fulfil a task of international character. Their aim should be to co-ordinate the policy pursued in the various centres in order to contribute towards the satisfactory working of the international gold standard system.
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> "Moreover, they should endeavour to adapt their measures of credit regulation, as far as their domestic position permits, to any tendency towards an undue change in the state of general business activity. An expansion of general business activity of a kind which clearly cannot be permanently maintained should lead Central Banks to introduce a bias towards credit restriction into the credit policy which they think fit to adopt, having regard to internal conditions in their own countries. On the other hand, an undue decline in general business activity in the world at large should lead them to introduce a bias towards relaxation.
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> "In pursuing such a policy the Central Banks will have done what is in their power to reduce fluctuations in business activity and thereby also undue fluctuations in the purchasing power of gold."

This passage revives the teaching of the Genoa Conference and might be transcribed as an epilogue to Mr. Hawtrey's book.

CECIL KISCH.

Trade Depression and the Way Out. By R. G. HAWTREY. (Longmans, Green & Co. London. 1933. Pp. x + 183. 7*s.* 6*d.*)

THIS book is an enlargement of a pamphlet written by Mr. Hawtrey, and published, in 1931. It consists mainly of a critical history of monetary developments in the last ten years; there is

also some theoretical exposition and polemic against alternative views. It is written in his most engaging and brilliant style. Mr. Hawtrey has a great command of historical narrative. He has a singular power of selecting the essential, and, while not disdaining at times to insert minute detail, he never loses sight of his general purpose, and enables the reader to grasp the historic process as a unity. Moreover, he is incapable of obscurity or of tedium.

The villain of the piece before 1931 is the French legislature, which did not give the Bank of France power to buy securities. It is fair to add that the Bank of France was in no mind to ask for such a power. The consequence was that the rising demand of the French public for means of payment after the depletion due to the inflation culminating in 1926 could only be met by imports of gold. Some blame is also attached to the British authorities for not allowing easier money in the period after 1925. Then after the collapse in November 1929, " it was the tardy and half-hearted treatment of this situation, not only in America but in England, that was responsible for the depression getting beyond control " (p. 106). The Federal Reserve Banks did indeed purchase securities, but desisted in July 1930. It is arguable that not only was this cessation wrong, as Mr. Hawtrey holds, but also that the scale of purchases was altogether inadequate, considering that the ebb of recession was much more ominous than it had been when the Banks had taken no less vigorous measures in 1924 and 1927. The defeatist spirit of the Federal Reserve authorities in those early months is perhaps the most heart-breaking feature of the whole story.

In the realm of theory Mr. Hawtrey is not engaged in this volume in erecting an elaborate analytical structure. He is concerned to state a case in its broad outline and to wage constant warfare with the hosts of follies and fallacies that beset monetary theory. On the whole he is admirably successful. In one place he does not appear to apprehend quite clearly the case of his opponents. While we may agree that " in 1929 there was no inflation in the United States " (p. 35)—or at least insufficient inflation to have serious repercussions—in his treatment of Professor Robbins' views (p. 122) he seems not to appreciate that it is an alleged large decline of costs there not matched by an equivalent decline of prices that is supposed to have produced a quasi-inflationary situation in 1929.

An unswerving champion of monetary stabilisation, Mr. Hawtrey is sceptical of the desirability of large-scale public works. He thinks that relentless persistence by the Central Bank in the pur-

chase of securities would do the trick. He may be right. Ultimately accumulated balances will find their way into something or other. But in the process the joint stock banks might be driven into a position in which the item of investments far exceeded all their other assets. Is it clear that such a position would be without dangers? On the other hand, he thinks that the sums involved in public works schemes are too small. "A programme of £100,000,000 a year sounds impressive, but it is only 3 per cent. of the national income" (p. 137). But why only £100,000,000 a year? Why this fine careless rapture, this heroic abandon in matters for which the Bank of England would be responsible, and this niggardly caution when the responsibility belongs to the government? And what of the secondary expenditure entailed by such a programme? The argument that schemes put under way might outlast the need for reflation can be met; for when the need for reflation is at an end, the residue of the schemes can be financed out of taxation.

Mr. Hawtrey thinks of inflationary borrowing in terms of the creation of bank credit. This seems to suggest that he has not yet accepted Mr. Keynes' view that borrowing from the public for the purpose of real investment may have an inflationary effect by diverting the flow of money that goes to cover entrepreneurs' losses in a depression.

The sections of his argument which seem least convincing are those concerned with competitive exchange depreciation. That this is an absurd bogey we may well agree. But to the view that each country can by depreciating its currency send up its own price level without damaging the external price level it is less easy to subscribe. Imagine the world divided into two areas, A and B. The authorities of A arrange that the value of its currency in terms of B's is reduced. The necessary consequence is a realignment of prices, such that international goods have the same price in A and B, taking the new rate of exchange into account. But in virtue of what is it certain that it is the A prices which will move? Is it not equally likely that B prices will fall to the new appropriate level? It is still more probable that A prices will rise somewhat and B prices fall somewhat. While refusing to regard competitive exchange depreciation as a menace, we need not rush forward and hail it as a panacea. Mr. Hawtrey's views on this subject are no doubt responsible for what might be taken to be a gap in his narrative on p. 59. He describes the American reflation of 1932 and its stimulating effect. "But the revival did not last." He offers no clear explanation. May it not be that the set-back was

due to the renewed weakness of sterling at that time and the depressing effect exerted by the fall of sterling on world gold prices, and therefore on dollar prices?

R. F. HARROD

The Rate of Interest in a Progressive State. By J. E. MEADE. (Macmillan. 1933. Pp. viii + 115. 7*s.* 6*d.*)

MR. MEADE has published the results of his work on dynamic equilibrium of the economic system while they are still tentative and uncertain, foregoing the temptation to impress the world with a more polished achievement in the belief that it is "justifiable, and indeed desirable, that economists should publish their thoughts on a problem on which a great number of other economists are working, even if their work is admittedly very incomplete; for advance can most efficiently and quickly be made by such sharing of ideas and by co-operative work." For this reason the book consists rather of a collection of separate pieces of analysis than of a single systematic argument. Nevertheless, it represents a considerable feat of bold and independent thinking. Mr. Meade is a follower of Mr. Keynes, but he has an original contribution to make, and his work is not like so much that has recently appeared, in which the jargon of "savings and investment" is used to cover a complete misapprehension of Mr. Keynes' point of view. Breaking away from the vain circle of controversy and misunderstanding, Mr. Meade has struck out on a path of his own. The same impression of intellectual boldness is conveyed by his method of presentation. The analysis is set out in the barest possible style, without allusions to other writers (save for two short notes of criticism, one on Mr. Keynes and one on Dr. von Hayek, each of which appears to be just), without historical illustrations, without reference to current problems, without figures of speech, without any concession to the human weakness of the reader. His heroic austerity is at times carried to such extremes as almost to suggest a parody of itself; nevertheless, it cannot fail to provoke admiration.

The opening theme is a system of Neutral Money—a monetary system which "simply interprets the decisions of individuals . . . without, by its own action or inaction, making the effects of such decisions different from what they would have been in a non-monetary economy" (p. 11). A neutral system, in Mr. Meade's view, would be one in which (with a given population) the total of money incomes of the community is kept constant. Under

this system, he holds, a spontaneous change in current consumption will lead to an equivalent opposite change in investment, and *vice versa*. It ensures, for instance, that a desire to increase saving will be prevented from stultifying itself by reducing incomes, and will be implemented by an appropriate increase in the value of the output of capital goods. But he fails to establish the validity of this concept. The action of each individual alters the situation for his neighbours. The decision of some individuals to spend less will reduce the incomes of others, and so incline them to save less. It is impossible to give any unique meaning to the " decisions of individuals " taken collectively. Mr. Meade states that " any decision on the part of the economy that more shall be spent on consumption goods is synonymous with a decision that exactly so much less shall be spent per period on Net Investment " (p. 13). Why so? Might it not equally well be interpreted (in the absence of full employment, which is not postulated) as a decision to increase total output? It appears that Mr. Meade's economy would be condemned to continue indefinitely with whatever amount of unemployment happened to obtain when the " neutral " policy was first introduced. That is, if money wages are constant. And in face of a change of money wages the policy of " neutrality " would completely break down. By what method are the banking authorities to ensure that the total of money incomes shall remain constant when wages fall? And by what stretch of imagination could such a violent interference with the distribution of real income, if it were carried out, be regarded as a policy of neutrality?

The whole notion of " neutral money "—based upon the conception of disturbances to some kind of natural equilibrium, which are due to purely monetary causes and would be eliminated if the banking system could be made to behave perfectly—is impregnated with a curious kind of mysticism which regards " monetary influences " as in some sense arbitrary or harmful, and which proceeds to confuse " monetary influences " in the sense of " influences due to decisions of the monetary authorities " with " influences which we are accustomed to discuss under the heading of monetary theory." The fact that the manner in which I spend my income affects the incomes of my neighbours is " monetary " in the second sense, but not in the first, and there appears to be no virtue, either as an analytical device or as a guide to practical policy, in a system designed to eliminate " monetary influences " of this sort.

But Mr. Meade shows only the faintest symptoms of infection

with monetary mysticism. The main part of his book is completely free from it, and his analysis is conducted throughout with a rigour and thoroughness which inspire great confidence in the reader. Much of his argument is independent of the notion of "neutral money," and much which he has set out in connection with it can be detached from it and given other applications. The chapters on the Long- and Short-term Rates of Interest, and on the Structure of the Productive System are particularly useful from this point of view. But perhaps his most original contribution is to introduce the notion of the supply curve of capital goods. This is one of those simple innovations which are seen to be indispensable as soon as they have been made, so that we immediately begin to wonder how we have managed so long without them. It is this kind of seemingly obvious improvement which reflects the most credit on its discoverer, for ingenious and far-fetched refinements upon the existing apparatus of thought are much easier to produce than the simplest fundamental changes in its structure.

The last few pages are devoted to showing that the type of equilibrium required by Mr. Meade's neutral system is not automatically attained, but must be the result of conscious policy of the banking authorities. He shows that even in the most favourable case, where the whole of, say, a decrease in expenditure on consumption goods is devoted to the purchase of securities, there is no guarantee that a corresponding increase in current investment will take place, in the absence of a deliberate effort to reduce the rate of interest. The increased demand for securities will lead, on Mr. Meade's assumptions, to a rise in their price (which is equivalent to a fall in the rate of interest), but this rise will tempt some of the holders of securities to sell, since the relative advantages of holding wealth in the form of securities and in the form of cash are now altered in favour of cash. Thus, although an increase in saving is likely to lead, in the first instance, to *some* fall in the rate of interest, it cannot lead to a fall sufficient to induce new investment equal to the whole of the new demand for securities, for part of the new demand for securities will be met by old securities changing hands. And if an increase in investment equivalent to the decrease in consumption is not immediately induced, the vicious circle of slump conditions will immediately start to revolve.

But Mr. Meade is not for the most part concerned with the causes of disequilibrium. His main intention is to discuss "the conditions of dynamic equilibrium as a necessary preliminary

to a study of disequilibrium," in the conviction " that economists must make a much more intensive study of the monetary conditions of dynamic equilibrium before the theory of trade fluctuations and disequilibrium can be much further advanced " (p. vii). Most of the discussion of monetary problems is conducted at the very frontier of immediate problems, and is therefore carried on in terms of short-period analysis. Mr. Meade has retired to a half-way house between the short and the long period. In my opinion the retreat towards a discussion of equilibrium conditions must be carried still further. The argument of his own Chapter IV shows that in the kind of long-period equilibrium appropriate to the ordinary theory of value no investment is taking place, and it is clearly necessary to go behind Mr. Meade's line of retreat and to explore the still more remote territory of the stationary state. But his failure to do so is no reproach. Even when we are progressing backwards it is necessary to go step by step, and Mr. Meade has now reached a point from which the next step will not be difficult to take.

JOAN ROBINSON

The Portuguese Bank Note Case. By Sir CECIL KISCH, K.C.I.E., C.B. (London : Macmillan & Co., Ltd. 1932. Pp. 280. 10*s.* 6*d.*)

THIS book is both good reading and of special interest for economists.

The story of the creation, issue and recall of the 209,718 Vasco da Gama notes of 500 escudos each (equivalent at the then prevailing rate of exchange to £1,092,281) is unique in the history of note frauds, by reason both of the magnitude of the operation and of the ingenuity with which it was carried out. The ringleader was Senor Alves Reis, the Managing Director of the Banco Angola e Metropole. It is not clear to what extent his associates and assistants possessed guilty knowledge or were merely his dupes. In December 1924 his agent, Mr. K. Marang Van Ysselveere of Messrs. Marang & Collignon, The Hague, approached Sir William Waterlow of Messrs. Waterlow & Sons, Ltd. with three documents, namely :—

> (1) A forged document purporting to be between the Government of Angola and Senor Reis and to entrust the latter with the supply of notes of the Bank of Portugal of " the new Angola issue with currency in the Metropolis and in the Province of Angola."

(2) A forged document purporting to be between the Bank of Portugal and the Government of Angola and to authorise the latter, and Senor Reis on behalf of the latter, to arrange for the printing of notes of the Bank of Portugal of a specified kind and up to a specified amount.

(3) A Power of Attorney from Senor Reis authorising Messrs. Marang & Collignon to act for him in the matter.

How, on the strength of these documents, supported by forged letters purporting to be from the Governor of the Bank of Portugal and to authorise the use of the plates from which Messrs. Waterlow had already supplied Vasco da Gama notes for the Bank of Portugal, the firm was induced to print off more of these notes and deliver them to Mr. Marang Van Ysselveere, how the spurious notes were put into circulation in Portugal partly by individual agents of Senor Reis, but largely by the Banco Angola e Metropole, how the crime was brought to light by the discovery at Oporto on the evening of Saturday, December 5th, 1925, of four identical pairs of notes, how the Bank of Portugal, acting with promptitude and prudence in order to maintain public confidence in the currency, at once called in all Vasco da Gama notes, good and bad, giving in exchange for them other notes of a different design, how the swindlers were apprehended, the Banco Angola was wound up, and an action commenced by the Bank of Portugal against Messrs. Waterlow—all this is told in the first part of the book and in a most entertaining manner. The atmosphere of this part of the book is at times reminiscent of detective fiction.

The second part of the book reproduces, without comment, the substance of the judgment of the three tribunals in London which dealt with the case between the Bank and the printers. The Bank claimed, in the first place, that in printing and delivering the spurious notes without the Bank's authority, the firm committed a breach of contract; secondly that this breach of contract obliged the Bank to issue notes to the value of 104,859,000 escudos without receiving anything of value in exchange; and thirdly that it was entitled to recover this sum together with the cost of the genuine notes rendered valueless (less the amount recovered from the liquidation of the Banco Angola) by way of damages from Messrs. Waterlow.

On the first claim it was found that there had been breach of contract through negligence, but in circumstances so extraordinary that there was no reflection on the firm's honour or good faith. Nor did the Bank have much difficulty in establishing the

second claim. It is around the third claim that the interest of this case chiefly centres, since it gave rise to an extraordinary difference of opinion between the learned Judges.

The majority in substance held that in the ordinary course of business the Bank would not have parted with notes to the face value of 104,859,000 escudos without receiving in exchange assets possessing a market value of 104,859,000 escudos (*e.g.* gold, bills, securities), that in this case it was obliged to part with them without receiving anything in exchange except spurious notes, and that the Bank *ipso facto* lost 104,859,000 escudos, so that its third claim was good. On this basis judgment was entered against Messrs. Waterlow for £610,392.

Three, however, out of the nine Judges who heard the case took a radically different view. They approached the question from the angle of the Bank's Profit and Loss Account. Had the Bank succeeded in showing any injury to its profit-making capacity as the result of the events? Had it shown any loss except the cost (£8922) of replacing the notes issued in exchange for the Vasco da Gama notes, good and bad? The three Judges found the answers to these questions to be in the negative, pointing out that the notes, being inconvertible, involved the Bank in no obligation to the holder which could not be satisfied by the issue of a piece of paper. In their view the Bank was entitled to recover only £8922.

Here was a remarkable divergence. To the majority of the learned Judges it seemed incredible that in parting with notes to the value of about 105 million escudos the Bank could have lost practically nothing. To the minority it seemed equally incredible that the loss could have amounted to a sum representing nearly eight times the Bank's capital. Sir Cecil Kisch, as the author of a standard work on Central Banks, is well qualified to say a last word on the puzzle. This he does in the third and final portion of the book, in which he examines the question of the financial loss sustained by the Bank of Portugal from the economic standpoint, with admirable lucidity, with a wealth of argument, from every angle. Not the least valuable part of this analysis is the light which it casts *en passant* on the operations of Central Banks, a subject which has been shrouded in too much obscurity and in which economic students have suffered from a dearth of good literature. It would be a pity to spoil this part of the book for the reader by attempting more than a very brief, and therefore necessarily inadequate, indication of the author's conclusions, which are to the following effect.

The Bank had certainly a trifling loss amounting to the cost of replacement (£8922) when it replaced the Vasco da Gama issue. If it sustained any further loss, it was the consequence, not of the replacement, but of the reactions on the Bank of the inflation resulting from the putting into circulation of the spurious notes throughout 1925. The Bank was not obliged by circumstances arising out of either the law or its statutes or the policy imposed upon it by the Government to use its own resources for the purpose either of cancelling the additional issue or of providing a normal asset against it, nor in fact did the Bank do so. The Bank did not therefore incur loss on this account. So far as the Bank's earnings were derived from its commercial issue, they depended on how many notes it could keep in circulation against interest-earning assets. This depended on its monetary policy. During 1925, 1926, and 1927 the Bank kept the external value of the escudo fairly constant, and in this period the inflation of 1925 may have prevented it from keeping in circulation as many notes as it would otherwise have succeeded in doing, and may therefore have caused some reduction in the Bank's earnings. The loss on this account cannot be estimated precisely, but it was nothing approaching £610,392, nor was the Bank entitled as a matter of law to recover it since it tendered no evidence on this point. In 1928 the position was transformed by a fall in the external value of the escudo, which permitted the Bank to put out many more notes than before and obliterated any further losses to the Bank from the inflation of 1925. The main damage from the events of 1925 fell, not upon the Bank of Portugal, but upon the escudo-holding public.

The business of a Bank of Issue is of an altogether exceptional character. The Courts required more assistance than they in fact received in elucidating its principles and technicalities. It is believed that it is now widely recognised that the final judgment cannot be reconciled with the economic facts.

G. D. ROKELING

What Everybody Wants to Know about Money. By nine economists from Oxford. Planned and edited by G. D. H. COLE. (London: Victor Gollancz, Ltd. 1933. Pp. 544. 5*s*.)

THE editing of a popular volume on a controversial subject with a large team of contributors is no easy task, but Mr. Cole has achieved considerable success in this book. Intended primarily for the general reader, the treatment of the various subjects lacks uniformity, and some of the chapters, though interesting to the

economist, are scarcely within the grasp of "the man in the street." Nevertheless, a large part of the book will be useful to the layman, and it should also be valuable as a text-book for students.

The volume lacks co-ordinated development and there is appreciable overlapping. Much of the matter is descriptive, but many controversial points are raised and socialist solutions are usually proposed. The discussion of these questions is, however, stimulating, and the socialist tendency does not obtrude itself sufficiently to make the volume unsatisfactory for non-socialist readers seeking information. The book does not aim at originality, but the writers usefully bring together information on monetary systems and current monetary problems which has not hitherto been available in one relatively elementary volume.

In the first two chapters Mr. Cole describes the various kinds of money, the functions of banks, the Quantity Theory, the alternatives of "automatic" and "managed" monetary systems, and reviews the monetary factor in the world crisis. He is of opinion that the Quantity Theory, though in a sense valid, is always in danger of being a truism inapplicable because its elements are difficult to measure. Monetary management is advocated even though it is recognised that many mistakes will be made. Mr. Cole considers that during depression an issue of more money will bring unused productive resources back into play, and he therefore favours reflation accompanied by measures to prevent speculative excesses and to insure, *e.g.*, by a policy of higher wages, that consumers' incomes shall rise sufficiently to buy the increased output at higher prices. In the long period in a country in which prices and costs are in equilibrium and productive resources fully used Mr. Cole favours a policy of allowing prices to fall as productivity increases, this offering the best hope of avoiding monetary disturbances of economic equilibrium. Prices, however, should not fall to the full extent of the increase in productivity, the balance being preserved by a deliberate policy of raising wages, and also, where necessary, by using the instrument of taxation.

Mr. Harrod in his chapter on Currency and Central Banking expresses preference for the British fixed fiduciary note issue with 100 per cent. gold backing for additional notes to the legal minimum percentage gold reserve, but thinks a maximum note issue without a specific amount of gold backing would be better still. He believes that a country off gold can, by making the value of its money fall in terms of gold during a period of falling world prices, mitigate the repercussion of world depression. He supports international co-operation for revival of demand by increased capital output or

unbalanced Government expenditure. In practice, however, international co-operation has proved inadequate and each country endeavours to spend little while hoping to benefit from the recovery programmes of other countries.

In a descriptive and critical chapter on Commercial Banks and Credit Mr. Radice argues in favour of State control of the quantity and direction of credit. He claims that central control of the British Joint Stock Banks is necessary if the needs of industry as a whole are to be met. Foreign Trade and the Exchanges are treated by Mr. Vallance, who criticises " mercantilist " opposition to imports, and gives an interesting classification of countries which are mature creditors, immature creditors, mature debtors and immature borrowers. He also examines the financial crisis of 1931 from the angle of the foreign exchanges, discusses the dangers of currency warfare, and argues that a radical writing down of foreign obligations will be necessary if exchange stability is to be ensured.

Systems for the investment of capital, including underwriting, issuing houses, Government issues, the Stock Exchange and investment trusts, are reviewed by Mr. Mitchison. He considers that individual investors have little chance in the long run in the investment market as now organised, and have to pay for a whole system of financial parasites. Provision for the needs of industry at home and control over British overseas issues have been inadequate. Capital and investment systems should make proper use of the savings of the community and not be " the instruments for bankers' profits, bankers' control or industrial power that they seem now to be." He therefore proposes banking control, and a National Investment Board to plan investment in the national interest in accordance with planned economy.

Mr. Durbin's chapter on Money and Prices is of interest to economists, but it is unlikely that the general reader will follow all the underlying implications of the argument. Mr. Durbin favours a monetary system under which " the *general level of money incomes* should be stabilised . . . so that prices fall as productivity increases, but only in the same proportion as efficiency increases." This would be intermediate between the systems of price stability and of stability in the effective quantity of money. In a world economy he favours a number of separate constant income systems, the price and trade relations between which would be maintained by slowly fluctuating exchange rates rather than by the gold standard, though he admits that some reduction of world trade would result. In discussing price changes it is not always clear whether long-period trends or cyclical movements are under con-

sideration. The treatment of stability in the quantity of money spent is somewhat artificial in the absence of allowance for changes in the velocity of circulation. Mr. Durbin also argues that it would be practically impossible to restrict credit to a constant total of effective money, but fails to indicate that many of the same difficulties would be encountered in adjusting credit policy so as to insure the operation of his own proposals. These comments apply also to several other chapters.

"Four Monetary Heretics" are criticised by Mr. Gaitskell, the "victims" selected being Major Douglas, Professor Soddy, Silvio Gesell and Robert Eisler. Though their analyses and proposals for reform are regarded as being fundamentally erroneous and some of them are shown to be guilty of ambiguity, tribute is paid to the value of certain of their ideas. Mr. Colin Clark writes on Investment, Savings, and Public Finance. He claims that in Great Britain at the present time investment falls short of savings by approximately £300,000,000 a year and thinks that the closing of this gap would represent employment for a million and a half more workers. He favours a big programme of public works, a forward wage policy which should keep pace with technical progress, and increased expenditure on social services, and he seems to hanker after an unbalanced budget.

Mr. Hargreaves deals with debts, including the effects of inflation and deflation upon indebtedness. The international debt problem is considered to be of much greater importance than national debts, and it is argued that the relief which would result from a rise in prices would not give a complete solution; readjustment of international debts and control of capital movements seem to provide the only ultimate solution.

Mr. Cole resumes the argument in a chapter on the Socialisation of Banking, which he advocates mainly because of its importance in industrial planning and control. Central Banks and deposit banks must be brought under control at an early stage in the transition to socialism; ultimately the bill market and acceptance houses would be brought into the controlled system. A National Investment Board co-ordinated with the banking system would undertake long-term investment, and the Insurance Companies would be socialised, with a State guarantee to policy-holders. The Central Bank would be conducted by a publicly owned corporation administered by persons appointed on grounds of competence; matters of high policy would be under Government control.

J. HENRY RICHARDSON

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Essays on Monetary Management. By J. STAFFORD, M.A. (London: P. S. King & Son, Ltd. 1933. Pp. x + 230. 7*s.* 6*d.*)

THIS volume contains three essays, the second of which has already been published in *The Manchester School.* The first essay, called "Income and Banking Policy," is mainly concerned with hoarding and its counteraction by the banking system. Mr. Stafford develops algebraically an ingenious argument whose main weakness is, I think, that it assumes the period of production to be no greater than the period of circulation of money as income. Nevertheless, the artificiality of Mr. Stafford's assumptions reinforces his main conclusion (pp. 47–48), which is that constructions designed to measure the benefit to income, and still more to employment, of a given injection of credit, rest upon the most doubtful foundations. The whole argument confirms one's impression that current calculations of the quantitative effect of public works expenditure, particularly when no definite period of time is specified for the reactions to take effect, are worth a great deal less than has usually been claimed for them. The essay concludes with a sensible discussion of the relations between savings deposits and securities.

The second essay is entitled "The Relation of Banking Technique to Economic Equilibria," and consists of an inquiry as to how far the ordinary motives—a desire for profits coupled with a desire for liquidity—are likely to cause the commercial banks to distribute their resources between different classes of asset in the optimum proportions from the social point of view. Mr. Stafford concludes, for example, that when a fall in the internal price level becomes necessary for external reasons, it may be desirable that the banks should diminish the ratio of their advances to their more liquid assets beyond the point of maximum profit to themselves. Finally, he remarks that the customary relation between rates on different classes of asset will by no means necessarily ensure equi-marginal returns.

The third essay, on "Central Banking Problems," is perhaps the least satisfying of the three. Here Mr. Stafford is mainly preoccupied with the possibility of insulating a country on the gold standard from the effects of external disturbances of a temporary nature. A large part of the essay is accordingly taken up with a discussion of what Professor Mises calls *kleine Mittel*—including tariffs, the control of foreign investment, equalisation funds, and even periodic revaluation. All this is topical enough, but, as Mr. Stafford himself is driven to admit, there can be no real justifica-

tion for measures of this kind as long as it is impossible in practice to distinguish between the temporary and the permanent among price level disturbances originating abroad.

Mr. Stafford's essays are interesting, thoughtful, and in most places extremely sensible. His English suffers from a certain tendency to involution, which makes it not quite as easy to read as it might be.

HAROLD BARGER

University College, London.

A Critique of the Gold Standard. By H. L. PUXLEY. (London: Allen and Unwin. 1933. Pp. 272. 10*s.* 6*d.*)

The Sterling–Dollar–Franc Tangle. By PAUL EINZIG. (London: Kegan Paul. 1933. Pp. xii + 207. 7*s.* 6*d.*)

FOR a straightforward account of the events leading up to the collapse of the gold standard as a world institution, the first five chapters of Mr. Puxley's book may be recommended; while Chapters VII and IX form in many ways an able presentation of the case for a general return to that standard. His discussion of the prerequisites for such a return follows common-sense lines, though his proposals for an international Central Bank might be called ambitious. The most serious weakness of the book, however, lies in Chapter VI, where he nowhere does justice to the arguments which can be advanced against any form of international standard. Mr. Puxley does not seem to have heard of any other goal for internal currency management than price stability. If in 1925–9 the United States had chosen to stabilise bank debits, or money wages, or even incomes in general, history might have turned out very differently. Nor does it follow that because the Reserve System had lost control of the credit situation in 1931–2, it could not have kept that control if previously it had interpreted stability otherwise than in terms of a constant commodity price level.

In this book Dr. Einzig maintains his already well-established reputation for amusing, if somewhat sensational, financial journalism. He deals here mainly with the Economic Conference of last year, and in its way his contrast between the American, French and British points of view is extremely well done. His story of the Keynes–MacDonald luncheon (p. 112) is especially amusing.

HAROLD BARGER

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Lasting Prosperity. By A. G. McGregor. (London: Sir Isaac Pitman & Sons, Ltd. 1934. Pp. xiv + 201.)

A Business Man's View of the World Crisis. By L. Potter. (London: Williams and Norgate, Ltd. 1934. Pp. 151. 3*s.* 6*d.*)

Mr. "Potter," speaking as "the unknown business man," gives us a plain account of how he would restore prosperity to a distracted world. The evils which beset us are psychological in their origin. The entrepreneur has suffered a series of shocks which have sapped his morale and undermined his confidence, and without the entrepreneur nothing moves. It is true that in this country credit has been restored to a remarkable degree, but enthusiasm for the conversion of the War Loan has raised no corresponding enthusiasm in the business world. There has been an enormous expansion of borrowing facilities, but very little borrowing.

To restore the confidence of the entrepreneur and so start the wheels once more, Mr. Potter recommends the raising of wholesale prices and a line of action which will keep prices stable once they have been sufficiently raised. To this end he would break finally with gold, establish a managed currency and, in the initial stages of reconstruction, encourage and assist private enterprise by means of government guarantees. He begs that we shall not make a bogey of government intervention, and would seem to imply that a Conservative Government might justifiably steal a little Labour thunder and so avert a really destructive storm later on. He is all for planning, and recommends the establishment of an Industrial Board with a constitution and powers similar to those of the Bank of England.

Exactly how the planning is to proceed, and how the arrangements are to be carried out, Mr. Potter does not feel competent to decide: he would no more think of designing the details than of erecting his own electrical plant. But he is convinced that it can be successfully done if experts are put on the job, and he only asks that practical men and not academic theorists shall be entrusted with it.

Mr. McGregor too is of the opinion that gold is the villain of the piece, and he also looks to the Government for a rational control of the situation, although his government control is something quite different from Mr. Potter's desired intervention. He too holds that the raising of wholesale prices and the subsequent keeping of a stable price level is the only way to salvation. But he is quite sure that he knows exactly how it can be done.

He is by occupation an engineer, "accustomed to dealing with intricate problems," and society is for him an affair of strains and stresses capable of exact adjustment by a skilful hand. We must in the first place get a true balance between the power to produce and the power to consume, and this we can achieve by fixing prices at a level where all the goods and services produced will be consumed, and all labour and capital will be comfortably employed. Since cost of production consists almost entirely of wages, purchasing power depends on the wage level, and all we need to secure the requisite balance is an intelligent control of salaries and wages. When, for instance, prices show any tendency to sag, instead of resorting to wage cuts, which aggravate the evil, we should raise wage and salary levels by government decree. Higher wages will cause an immediate increase of demand, and prices will at once recover. Conversely, if prices show a tendency to rise, we must lower salaries and wages, and by the consequent diminution of demand bring back prices to their normal level.

On the consequences of entangling the national currency with gold, on the futility of tariffs, and the shortsightedness of a policy which encourages the export of goods that a low wage level will not allow our own population to consume, Mr. McGregor has many excellent things to say. He shows how internal price regulation cannot succeed so long as export and import are left in private hands; consequently he would prohibit the export of capital, and would have the financing of all foreign trade pass through government agency. In effect the Treasury would pay exporters for goods exported and would receive the value of goods imported from the importers. An international Clearing Association would provide an ideal method of international exchange. There would be no more speculation in foreign exchange and the major causes of war would disappear.

There is nothing very novel either in Mr. McGregor's views on the best organisation of bank credit or in his proposal to regulate foreign trade by government agency. Similar suggestions have been made by more orthodox economists, and as long ago as January 1932 the London Chamber of Commerce put forward a scheme for the abolition of private dealings in foreign exchange on lines almost identical with Mr. McGregor's proposals. The originality of his treatise lies in his method of stabilising prices by raising wages on a falling market, and lowering them on a rising market. He has no doubt of the feasibility of his scheme, and feels sure that employers and employed need only have it

explained to appreciate the wisdom of the plan. It is here that the psychologist will probably part company with the engineer.

H. REYNARD

Escape from Stagnation. By G. U. PAPI. (P. S. King & Son. Pp. 156. 5*s*.)

THIS book makes surprising and stimulating reading for an English economist, because in it Professor Papi succeeds in denying the only propositions which meet with any general approval in this country on the subject of cyclical fluctuations.

First, he denies that the costing activities of a number of competing firms lead towards any long-period equilibrium even in the absence of monetary changes; and he makes a courageous attempt to build up a theory of general fluctuation upon the development of processes taking place entirely within the isolated production unit.

This leads him to his second point of divergence from accepted views. He denies that the Trade Cycle is a "monetary phenomenon" in the sense that it is caused by changes in the volume of effective money.

The story begins in Chapter II with a mysterious *deus ex machinâ* called a "favourable event," which is big enough and general enough to cause an upward movement in productive activity over the greater part of the industrial system. This general increase in investment can be and often is financed out of the idle stocks of money already held by producers and is subsequently maintained out of savings drawn from the "profits" emerging in the self-financed expansion of MV. That is to say, an increase in the volume of effective money may be wholly due to upward movements of Transaction Velocity according to Professor Papi. Some doctrine of this type would not be unacceptable except for the unfortunate fact that the nature of this essential "favourable event" is not very specifically described, and absolutely no attempt is made to show why such a "favourable event" should *necessarily* be generated during the period of Trade Cycle depression. Consequently there is no causal sequence in Professor Papi's analysis at this point, and he, together with certain other important economists, remains content to explain the upward turn of the cycle by simply saying that it actually occurs.

But the real point of surprise and dispute in the book appears in Chapter III, when Professor Papi analyses the results of the self-financed increase in investment. In the first period of this investment prices move up more rapidly than costs (p. 17), for the very

surprising reason that there is a limited number of the factors of production available for each particular product (p. 19). Not only would this condition, if it exists, seem to be a reason why costs should rise more rapidly than if there were a larger supply of available resources, but the condition itself is directly contrary to the assumption that there is general unemployment at the bottom of a depression. Be that as it may, most economists would be willing to concede Professor Papi's point that costs rise less rapidly than prices in the early stages of recovery, although they would attribute this tendency to quite different reasons. But, according to Professor Papi, after the first impulse to investment has begun, the induced rise in output leads to a progressive disequilibrium in the cost position (p. 22). That is to say, costs rise more rapidly than prices during the whole period of recovery until they overtake prices at the time of crisis and so lead inevitably to depression. Now Professor Papi gives a very strange reason for this relative rise in costs. It is not due to the general monetary inflation which is taking place, nor to the rise in the prices of non-specific factors in certain stages of production in the way that Professor Hayek suggests, *but is simply due to mistakes in cost accounting on the part of individual producers.* They continuously *under*-estimate costs, and *over*-estimate prices. Consequently they realise smaller and smaller profits and finally make absolute losses. Professor Papi's justification for assuming the universality and inevitability of this fundamental biassed error on the part of producers wholly escapes me. He repudiates with contempt the suggestion that the bias is psychological (pp. 19–20), and he is at great pains to deny that it is caused by an expansion in the supply of money (Chapter II *passim*). In Chapter III we merely get a long account of the *difficulties*, the *complexities*, and the *arbitrarinesses* of cost and price calculations; but no reasons whatever for a bias in one direction; nor do the later chapters provide them. This essential point remains the prime mystery of the book.

Given the argument of Chapter III, the rest follows naturally —the crisis (Chapter IV) is due to the final appearance of the net losses arising from inaccurate costing and which cannot be staved off indefinitely by further borrowing or restricted output. The Banks (Chapter V) merely accentuate and do not create this fundamental tendency to over-estimate prices and under-estimate costs. The facts, according to Chapter VI, bear out the general argument of the book. Other people (Chapter (VII) are wrong because they neglect this fundamental disharmony, and finally (in Chapter VIII) the only permanent cure for the depression is to be

found in a reduction of costs by the downward revision of wages, the restoration of profits, and the utilisation of all technical inventions. A final solution to the problem is only to be arrived at when the provision of knowledge and statistical forecasting removes the vital error in the estimating of costs. The economic institutions of a Corporative State are the most suitable medium for providing this essential information.

But of any further proof that producers must always over-estimate prices and under-estimate costs, all at the same time, relentlessly, without psychological communication and apart from monetary change, Professor Papi gives no sign. His assumptions may be correct, but I cannot feel that his present book explains in the very least why they are.

E. F. M. DURBIN

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The Price Policies of German Public Utility Undertakings. By H. E. BATSON. (Oxford University Press. Pp. 224. 12*s.* 6*d.*)

IN this study of the management and tariffs of the water, gas, electricity and tramway undertakings of twenty-eight German cities, Mr. Batson seeks to leave "the facts to speak for themselves," but cannot resist the temptation to bring in a little theory. The result is that the reader is often conscious of a superficial treatment of the general theory underlying the costs and price characteristics of public utilities, without being altogether satisfied that there is always a counterbalancing deep analysis of the particular facts under survey. Mr. Batson anticipates the first part of this criticism and puts us under some constraint by stating in his preface that he hopes "soon to publish discussions of some of these controverted questions." Apart from this major division of treatment the book also suffers generally from a rather unfortunate arrangement whereby such important matters as load and capacity factors (and why not diversity factor also?) are dealt with under water-supply characteristics, the very service of the four under consideration to which they are least applicable.

Considered as a purely factual approach the book provides much new and necessary information as to the tariff structures and organisation of German public utilities and should be of considerable value for comparative purposes. There are, however, two points on which more detailed and concise information would be desirable. First there is the competition between gas and electricity services and the effect which it may have on the respective price policies, especially as in twenty out of the twenty-eight German cities both undertakings are owned by the municipality.

The point is only briefly touched upon, and as to the extent of this competition we have largely to be content with quotations from two chairmen at Gas Company meetings, which are notoriously optimistic and which, in any case, relate to English conditions.

Secondly, there is the nature and the extent of the central and local legal control of the undertakings. Surely to classify an industry as a public utility implies that the legal aspect assumes the utmost importance, for, as Mr. Batson himself says, "the regulation of public utilities . . . is chiefly a matter of price control." While there is some general mention of this aspect there are many points at which we are left wondering as to how far the facts and conclusions are only fully explainable by reference to the legal position. A vital principle of approach is involved in this criticism. Perhaps Mr. Batson is solely concerned with the economic aspect of public utility operation; if so, the question arises whether this is possible in a study of this nature. Admittedly in discussions of abstract theory neither law nor politics have a place, but in a survey made of the actual workings of an institution these aspects are usually of considerable importance. It is the difference between the study of banking theory and the Bank of England. In his final chapter Mr. Batson rightly draws attention to the lack of a systematic body of thought on the economic aspects of public utilities. In so far, however, as this involves studies of a realistic nature, the lack will only be remedied by a *rapprochement* between the economist and the lawyer, that is, if American experience can be taken as any criterion.

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National Recovery Measures in the United States. International Labour Office: *Studies and Reports*, Series B, No. 19. (Geneva, Pp. 224. 3*s.* 6*d.*)

The A B C of the N.R.A. By C. DEARING, P. T. HOMAN, L. L. LORWIN, and L. S. LYON. (Washington: The Brookings Institution. Pp. 185. $1.50.)

Our Economic Revolution. By A. B. ADAMS. (University of Oklahoma Press. Pp. 196. $1.50.)

Price Control Devices in N.R.A. Codes. By G. TERBORGH. (Washington: The Brookings Institution. Pp. 45. 50 cents.)

Recovery and Common Sense. By O. M. W. SPRAGUE. (The Bodley Head. Pp. 96. 3*s.* 6*d.*)

THESE publications provide between them a full account of the Recovery Programme of the United States, and the last of

them offers a lucid and incisive judgment on the relations between the different parts of that programme.

The International Labour Office furnishes the text of the legislative measures and of the industrial codes, which is an invaluable work of reference. This is amplified in the second publication, which gives a free and most readable commentary on the texts, supplying also notes on the economic issues and background, the legal issues, the nature of the administrative organisation, the code-making process, and the measures for the administration and enforcement of the codes. Mr. Terborgh's monograph on price control devices has a very special interest in its account of provisions for the fixing of minimum prices or mark-ups; for its second chapter is of the nature of an administrative interpretation of the economic idea of the "representative" cost. The codes are classified so as to show how in different cases this has been understood. The minima are to be, in different codes, "fair and reasonable," or equal to the "lowest reasonable cost of production," or equal to the cost of the "lowest-cost representative firm," or "compensatory," or equal to the "weighted average cost of production"; while mark-ups, in two cases, are to equal the "modal" cost of handling and selling. But the chapters on provisions against selling below individual costs, and on open-price provisions, are an important account of the problem of economic competition.

Mr. Adams' volume has a definite point of view, which may be expressed as either the consumers' purchasing-power argument, or as the long-period view of the Recovery. He holds that it will not be possible to terminate the control which has been imposed on business, but that the government, without destroying fair enterprise, must retain the power to secure equilibrium between investment and the wage-policies on which the support of investment, if it is to be regular, must depend. The thread of this argument runs through a very clear description of the crisis. He does not think that the public works policy can be a permanent solution; here he foresees difficulties similar to those noted by Dr. Sprague.

In short, crisp paragraphs, Dr. Sprague explains how he came to differ from the official policy. He thinks that the depression is not mainly due to monetary causes, and that the outlet is not mainly through monetary policies. The kind of rise of prices which is desirable is to be obtained from the side of industrial demand, and this is to be encouraged by keeping down, relatively to other prices, the prices of those supplies for which the demand

is most elastic. A programme of house-building seems to him to offer such an outlet at present, if it is not obstructed by wrong wage and price policies in the industries which furnish the requisites. This policy, of the pursuit of the most sensitive consumers' demand, may be what Dr. Stamp, in his Preface, describes as "old paths steadfastly pursued." Dr. Sprague argues that past recoveries have depended on finding such sensitive demands in one quarter or another; and I think it is true that in England the recovery of enterprise has, since 1860, preceded that of prices. A policy of public works, Dr. Sprague holds, must both be ready to give way to the private revival of business, and must not obstruct that by excessive wage policies. As regards monetary policy, he holds that the depreciation of the dollar could only substantially affect foreign trade commodities, which were not a large enough part of the American market; and that, on other grounds, it might even have deflationary reactions. Both it and devaluation have uncertain effects when the gold standard is not abandoned because of over-valuation of the currency, and when there is no scarcity of currency at the time. "The attempt to inflate in a period of depression is an uncharted sea." At such a time, as I understand him, immediate results are to be sought in the stimulation, by suitable price policy, of demand for credit resources which are not deficient, and the private demand is more continuous than that which public works create. He is willing to grant some possible efficacy to "a nice combination of traditional monetary practice with some dollar depreciation, the more considerable use of silver, and even perhaps moderate additional issues of Government paper money" (p. 28). But he places the emphasis elsewhere for immediate results. In a concluding chapter he outlines a monetary policy, based on an improved international gold standard, recognising its defects and imposing a better banking practice to meet any possible scarcity of gold, or tendency to hoard it. This monograph is hard doctrine against recovery by fiat money, wages, or prices; but a community of "miserable sinners" (p. 37) must expect that.

D. H. MACGREGOR

The New Survey of London Life and Labour: Volumes VI and VII: Survey of Social Conditions. II. The Western Area and Western Area Maps. (London: P. S. King & Son, Ltd. 1934. Pp. xvi + 468 and six maps. 7*s.* 6*d.* net each.)

"THE relations between the poverty conditions of 1889 and 1929 may be expressed by saying that, if the conditions of life

and labour found by Charles Booth in the London of 1889 had continued to prevail, the total number of persons in poverty in the Survey Area in 1929 would have been upwards of a million and a half instead of less than half a million."

Thus the Director of the Survey sums up the position in London as a whole in another of the admirable Introductions which have been a feature of the New Survey volumes; and this confirms the information previously published in regard to the Eastern Area taken alone. But Sir Hubert Llewellyn Smith is careful to emphasise, as in the earlier volume, that the final impression is one of hope tempered by anxiety—hope, because of the real reduction in poverty and the undoubted rise in physical and economic well-being, anxiety, that, even in 1929, so many are still "living below a poverty line fixed according to the low standards of a past generation." Moreover, the advances have not come "without a conscious and sustained effort on the part of the community," and "any relaxation of efforts might not only mean the arrest of progress, but the loss of the ground already gained."

The present volumes "continue and complete the survey of social conditions in London," which corresponds to the Poverty Series in Booth's parent inquiry. As before, the method of inquiry has been a double one, containing the intensive House Sample and the extensive Street Survey, under the control respectively of Professor Bowley and the Director, and, as was the case in the Eastern Area, the results of the two inquiries show a high measure of correspondence. Thus, for London as a whole, the percentage decline in poverty is given as 69 by the Street Survey and 71 by the House Sample.

The arrangement now adopted is the same as that used in dealing with the Eastern Areas. The two main inquiries are followed by a series of Special Studies (Part III) and by Borough Summaries (Part IV). The chief additional matter in Volume VI consists of the analysing of the results for the whole of the Survey Area, whilst it was not found desirable to repeat the detailed description of the methods of the House Sample and Street Survey. Hence the two volumes are largely complementary and should be studied together. The Western Area, in fact, is far larger than what is ordinarily known as West London. It includes boroughs like Finsbury and Southwark, economically resembling the poorer areas of the East and South-East; and this tends to bring the proportion of poverty in the whole Western Area nearer to that of the Eastern.

"Probably the first impression made by the figures will be one of surprise, not that the West is richer than the East, but that the difference in the percentages of poverty in the two areas is not greater." The final calculations give 7·2 per cent. in poverty in the Western, and 10·7 per cent. in the Eastern Area. For the whole Survey Area the percentage is 8·7. The comparison with Booth's inquiry, based on families with children of school age only, shows a reduction of the percentage of poverty from 30·7 in 1889 to 9·5 in 1929.

The main causes of poverty are much the same in the two areas. In fact, after allowing for the higher percentage of poverty in the East, the general results of the inquiries in the two areas correspond fairly closely. In particular, the reduction in total poverty has been accompanied throughout London by a wider dispersion of the poverty that remains, and by the reduction in the number, though not yet entire elimination, of those "congested patches of poverty" which "very frequently tend to degradation and foster the slum habit of life, and have an important bearing on overcrowding, slum clearance and rehousing, as well as on the problem of mental deficiency." The decline in the importance of low wage rates, as a cause of poverty, and the increasing influence of unemployment are once more emphasised; and it is estimated that the percentage of the working classes actually in poverty is nearly double what it would be "when all the earners in the family are in full employment."

Special studies in Part III largely break new ground, though Mr. Arthur Llewellyn Smith's comprehensive treatment of the London Housing Problem may be regarded as continuing and completing the earlier survey of Overcrowding. The remaining studies deal with the Migration of Population (Dr. Hare and Mr. Michaels), Jewish Life and Labour in East London (Miss Henrietta Adler), Household Economy and Cookery in relation to Poverty (Miss Livingstone) and Mental Deficiency in relation to Poverty, by the Director of the Survey. All of them throw light on the more imponderable elements in the situation, which are least capable of statistical measurement.

Certain influences, operating in both directions, may make it desirable to modify the conclusions drawn from the statistical comparison with the conditions of 1889. Unemployment has already been referred to, and its increasing importance as a cause of poverty tends in some ways to increase distress. As regards the housing shortage, a special analysis of the House Sample suggests that poverty directly due to high rents and the

" pinching " of house room to keep above the poverty line are not pronounced. But there are other serious consequences. " Many families in London, far above the poverty line, cannot use their surplus purchasing power to satisfy their minimum needs for suitable and healthy housing, because there is no suitable accommodation available."

Other influences, however, tend to make the position as compared with 1889 more favourable than the statistical results suggest. Poverty depends not only on the amount of resources but upon the way they are used. Thus, waste, ignorance or lack of proper equipment can prove an important cause of Secondary Poverty. Here Miss Livingstone's sympathetic study suggests considerable improvement since the Booth inquiry. Knowledge of household economy has improved, though hardly in proportion to the expenditure incurred. Lack of adequate cooking utensils, again, has been largely removed, thanks mainly to cheapness and variety of supplies. The Director sums up that defects in household economy are " intimately bound up with straitened economic circumstances." Thus they are likely to be reduced by improvements in standards of living. The position is least satisfactory in regard to the provision of water and facilities for cooking, and this is brought out also especially in regard to the " undivided " tenement house by Mr. Llewellyn Smith's admirable and complete survey of the London Housing Problem.

The paper on Migration shows that " the stream to the centre is now inferior to the outward current," and the immigration is changing its character. Formerly it was mainly from the rural areas, but this " has become progressively of less volume and of less moment to the life and labour of London as conditions have been transformed by the great rise in public health, while the progress of mechanisation makes urban industry less dependent on country bone and sinew." The present influx is mainly urban, from the more depressed areas, attracted by the relative prosperity of London. The outward movement is largely a short distance one to the outer areas of London, following industries migrating to, or establishing themselves in, such areas, particularly to the North and West. Again, Miss Adler's survey of Jewish Life and Labour brings out how the old difficulties due to concentration in limited areas and a small number of trades have been largely overcome by a dispersion, which is both industrial and geographical.

The Maps (Volume VII) are similar in character and scale to those published for the Eastern Area (Volume IV), but number

one less, as the Map on Overcrowding in Volume IV dealt with the whole Survey Area. Otherwise the arrangement is the same, with five Maps illustrating poverty and economic conditions in the different sections of the Area, along with a small key map. Streets and sections of streets were denominated by colours which indicated the predominant grades of the inhabitants. A mixture of grades was illustrated by stripes of a different colour from that of the chief grade; and the presence of a degraded or criminal element by black or a black stripe. The Maps provide an admirable companion to the descriptive volume.

N. B. DEARLE

The Logic of Industrial Organisation. By PROFESSOR P. SARGANT FLORENCE. (Kegan Paul. Pp. 280. 10*s.* 6*d.* net.)

IT is easy for Professor Florence to justify the chief premise upon which this book is based—namely, that in modern industry the large-scale unit is normally the most efficient. The author is careful to warn his readers that efficiency as measured "by the relation between return (or productivity) and cost" is not the sole criterion of industrial organisation, but for him, writing as an economist, this is the principal test in any discussion of the logic of industrial organisation. As might be expected of Professor Florence, the broader problem of industrial welfare is by no means neglected. The book contains many suggestions for promoting human welfare in industry, but the author's main problem is how to promote a more rapid growth of large-scale production with its attendant increase in efficiency.

Belief in the superior efficiency of large-scale organisation is based upon the three principles of bulk transactions, massed reserves and multiples. This is old wine in new bottles, but with an eye to the difficulties of the inexperienced and elementary student, the author is at pains to demonstrate the validity of his fundamental premise. Having done so partly with the aid of simple statistical examples, he proceeds to contrast his own logic with "the illogic of actual operation." He finds this "illogic" mainly in (*a*) the bewildering variety of products demanded by the consumer and produced by individual plants, (*b*) the predominance of small plants in manufacturing despite the advantages of large-scale production, (*c*) a close correlation between the size of firms and the size of plants so that small firms predominate in industries where the average plant is small, (*d*) the persistence of "minute, very small, small and smallish firms all employing less than 100" in non-manufacturing industries, except railway transport and

coal-mining. The author supports this view of a "glaring discrepancy between the logical theory of efficiency and the actual facts of industry" by relevant statistics drawn from Great Britain and the United States. He concedes the case for the small firm in some industries, but concludes that "there still remains a wide area where large-scale production is physically possible but is not in fact adopted."

Having thus made his point with commendable conciseness, Professor Florence essays the task of evaluating "the human forces that make for irrational, illogical and inefficient organisation." In the first place, the relations between producer and consumer are in some respects chaotic. To those who condone the variety of design of most products in response to the consumer's whims, Professor Florence replies that the business man is not simply one of many faithful servants. There is much standardisation in consumption. The needs of life and the conventional necessities of the standard of living may be produced under large-scale conditions. Similarly, the intermediate products and producers' goods can be standardised. But the producer very frequently sets out to indulge the consumer's passion for variety and novelty, and much advertising is based upon this human weakness, or folly as it often turns out to be. Professor Florence has great faith in the possibilities of statistical analysis of consumers' needs as an aid to standardisation. He draws attention to the use of market research in forecasting changes of fashion, in portraying the changes in employment in different industries, *e.g.* the growing importance of housing in recent years, and in showing the effect of changes in income upon demand. To curb effectively the consumer's desire for variety and to reduce costs in distribution monopoly may have to be established. Rationalisation receives a stimulus from this logical pressure for monopoly, though it may be necessary to curb the powers of the "rationalists" themselves.

From the relations of consumer and producer the book proceeds to a consideration of internal management and organisation of industry. This chapter contains a short introduction on investment and employment, which, according to the author, are often "rival antagonistic policies." The few pages leading up to this conclusion appear to contain some heresies which the author might have expounded more fully. When he resumes his main task again he moves rapidly and firmly over the chief problems of internal organisation created by the growing importance of investment and by variations in its volume. Labour policy in a depression, the economics of the shorter working day and of

multiple shifts, systems of management, and the relation of ownership to administration in modern industry are discussed with refreshing vigour and abundant suggestion for improvement on present practice. There follows a chapter on "Stimulus to Labour," in which, as might be expected, the author of *The Economics of Fatigue and Unrest* points the way to an adjustment of industrial relations to the complexity of large-scale production. He is not so convincing in arguing on "Stimulus to Investment" that we have now reached a (third) stage of investment "where inducements to private owners to risk their property can no longer avail against timidity and inertia to obtain the increasing supplies of capital that are necessary." Surely, if investors with funds are timid and inert they must depress the rate of interest, which is the greatest stimulus to investment.

Professor Florence completes his main task with a chapter on "Stimulus to Enterprise and Administration." Modern industry, like the Civil Service, is evolving a technique of administration that sometimes conflicts with the exercise of initiative. It is the task of the organiser to combine efficient administration with the maintenance of enterprise among his executives or managers. Professor Florence shows that many forms of organisation fail to evoke an adequate response from the managers, or they are weak in other respects, such as co-operation with other firms, capacity to reinvest capital or to make suitable appointments to positions of great responsibility. He gives most marks for administrative efficiency to firms controlled by professional men and trained administrators, but does not quote experience in support of his contention. It is thus not surprising that he attaches great importance to "Education for Administration," to which he devotes a final chapter.

If this book is a fair sample of Professor Florence's teaching in Birmingham the mantle of the late Professor Ashley has indeed fallen upon capable shoulders.

D. B. COPLAND

De L'Utilité et de sa Mesure. Par JULES DUPUIT. (Écrits choisis et republiés par Mario de Bernardi.) Torino: La Riforma Sociale. Pp. 228. 40 lire.

THE economic writings of Jules Dupuit have now been made available in a collection entitled *De l'Utilité et de sa Mesure*, published at Turin (*La Riforma Sociale*), and edited by Dr. Mario de Bernardi. The title is taken from Dupuit's contribution to the *Journal des Économistes* in 1853, in which he completed and

presented in a more systematic form the argument of the path-breaking papers which appeared in the *Annales des Pont et Chaussées* in 1844 and 1849. These latter papers have hitherto been accessible in only a few libraries; and a great service is rendered to economists by this beautiful reprint. It is also important to have available the article of the engineer Bordas (1847), which traversed Dupuit's first paper, and led to the re-statement of 1849. It was, in effect, the principle of the Consumers' Rent which was in dispute, and of which Dupuit had sought to make practical use in the policy of local charges. This volume also includes Dupuit's shorter contributions to the *Dictionnaire d'Économie Politique* (1852–3), a bibliography of all his publications, and the biographical notice of his colleague Mahyer. It is the second of a series of Reprints of scarce economic writings, under the direction of Prof. Einaudi, which are available to members of the Royal Economic Society on special terms. The present volume can be obtained by members at a price of 9*s.* on application to the Assistant Secretary, 6 Humberstone Road, Cambridge.

D. H. MacGregor

Management of To-morrow. By L. Urwick, O.B.E., M.C., M.A. (London: Nisbet & Co. 1933. Pp. xvii + 205. 8*s.* 6*d.* net.)

As Director of the International Management Institute at Geneva, Mr. Urwick is well qualified to deal with the problems of industrial organisation, and, if he does not solve them all, he puts forward ideas which may lead to their solution. The variations of human nature forbid us to speak of a science of management, but the scientific spirit can be applied, and the result in Mr. Urwick's hands is what may be called a philosophy of management. During the last fifty years the relations between the industrial unit and the groups surrounding it have become more complex; the manufacturer is brought into touch with international bodies, state activities, local authorities, trade organisations, and trade unions. He must substitute rational analysis for the method of trial and error, knowledge for opinion. On the physical side of production, scientific laws are applied, "but on the much more important human side of management, the task of inducing men to co-operate, the conception of scientific method is often ignored." Yet "every question that faces the business manager can be approached in the scientific temper." Management problems involve "all the legislative, planning, directing, supervising and controlling activities involved in economic operations." Manage-

ment research is carried out partly by specialist workers in industrial psychology, physiology, etc., partly in factories by managers seeking for greater efficiency, and partly in professional associations; but it must stretch out beyond the factory to consider the relations of the individual to the trade as a whole, to the combination or cartel, and, through problems of standardisation, control of production, and the like, to the community. Mr. Urwick thinks a policy of organisation should be assumed, and a list of the necessary activities drawn up, which will be the same for any size of undertaking, and grouped "into kinds and into grades of authority and responsibility." The tasks may be subdivided according to process, geographical area, objects of production, or subjects; the latter is the rapidly spreading "functional" form, where certain special professions, such as accountancy, works engineering, works chemistry, have already firmly established themselves. He then discusses how the co-ordinating authority should operate, and thinks that in business, as in the Army, there must be a "staff" who do not control the functional heads but assist the supreme executive by seeing that the "consequences of any decision have been worked out, are understood, and are being carried out" in proper correlation. Large-scale businesses, combinations, and cartels have their special problems over which traditional business secrecy has cast a heavy veil, but their scientific study is necessary and should be international. While the producer and distributor were the same person, he learned what the consumer wanted, and at what price, and how much. Herein the modern system of distribution has failed, with its interposition of stages between the producer and the consumer. "The main job of distribution is not to get rid of what production makes, it is to tell production what it ought to make." In every business there should be a "Marketing Division," which should study the "lines" of production, their most profitable prices, quantities, and qualities. This is now done to some extent, but without any unified policy; the salesman wants novelties and a wide range of choice, the man in charge of a manufacturing process wants a long run of an article for cheap production. The present crisis is largely due to a hitch between production and distribution, to the offering of the wrong goods or to the offering of the right goods at the wrong prices. The manufacturer should try to ascertain what the consumer wants and not, by mass advertising, to force the retailer to stock goods in uneconomic variety or of a kind which has to be forced on the customer. There should be research into distributive costs to ascertain

whether price-cutting is due to ignorance or to over-wide margins. The further standardisation can be carried, the more the retailer can keep the manufacturer informed of the state of the market, and the more the manufacturer can have long runs of a comparatively simple range of goods. The object of rationalisation is the avoidance of waste in the widest sense of the term, and for that the fullest co-operation of all parties is required. "Every industry should have its Council representing consumers, distributors and producers. Every locality should have its Chamber dealing properly with regional business. Every nation should have its economic general staff assisting and collaborating with these subsidiary agencies, and integrating its economic activities with those of other nations. These bodies should be created, not by the state alone, but by business itself acting in collaboration with the state; they should exist not to command, but to advise and to inform." There is an extremely interesting section on training for management, of which the keynote is "leadership can be taught."

HENRY W. MACROSTY

A History of Farmers' Movements in Canada. By LOUIS AUBREY WOOD. (Ryerson Press. 1924. Pp. 365.)

IF one examines the literature pertaining to the organised activities of Canadian farmers one is at once struck by two dominant facts. The first is that in practically every case the study is confined to a consideration of the developments within a limited area or over a limited period or is restricted to a particular form of farmer organisation or is undertaken more or less on the basis of a particular farm enterprise. There are, *e.g.*, such works as *The Co-operative Marketing of Grain in Western Canada, Agricultural Co-operation in Western Canada, Agricultural Co-operation in Ontario,* or *The History of the United Farmers of Ontario.* The second fact is that attention has been confined largely to co-operative business organisations of comparatively recent date and to a not inconsiderable extent to the organised movements of Western grain-growers since the turn of the century. Very little has been written concerning the extent to which farmer movements have arisen or existed for the express purpose of concentrating the agricultural section of public opinion, either in an external advisory manner or more directly by endeavouring to secure farmer representation in Parliament. Because of these tendencies there is a danger of conveying the false impression that farmer movements in Canada are not only of very recent origin

but are marked by a striking uniformity of aim and method. To correct this serious and common misapprehension a book which would give a connected and chronological account of the varied and numerous farmer movement developments over a longer period and for the entire country has been badly needed.

This book goes a long way towards meeting these requirements. Nearly half of it is devoted to events occurring before 1900. While it is divided into five sections, the separation is made chiefly in order to mark the main general divisions of development, or to indicate the areas and problems in which or around which farmer interest concentrated during particular periods. In no sense does this division destroy the thread of continuity of the story considered as a whole. The chief sections referred to are, in order, The Grange in Canada since 1872; The Patrons of Industry, 1889–1902; The Launching of the Tariff Struggle 1896–1911; and The Farmers' Movements in More Recent Times.

One cannot but be struck by the fact that farmer movements have always developed as the result of a widespread feeling that certain specific grievances existed. Interest in farmer movements has seemed to vary directly with the ability of farmers to fasten on to and discuss one or more matters immediately affecting them. As a logical sequel to this may be noted the lack of continuous interest on the part of farmers in their own organisations, a sort of an in-and-outness. This irregularity of interest is seen in the rapid rise or fall in organisation membership, and the rise and fall of this or that specific movement or organisation. Again, and really as part of the foregoing, one may note that just as the interest in and development of the movements have been largely spasmodic, so have the demands made and reforms secured been somewhat short run and opportunistic in character. Partly in the same connection may be observed the apparent fact that there has been a conspicuous absence of any permanent purely educational farmer movement. Such educational attempts as have existed have usually been attempts at studying the special matters about which immediate action was sought. Partly, one suspects, as the result of this absence of a long-run general educational programme there has been evident in many cases a paucity of good business managers and also in many cases an unfortunate degree of farmer suspicion regarding the actions of his own business representatives. Probably the leading conclusion, however, is that, despite many weaknesses in organisation, Canadian farmers have after all managed to focus farmer public opinion to a remarkable degree, and as a result have secured for farmers a totality of governmental con-

sideration far greater than is often believed. This is, of course, especially true of situations where farmers constituted a large proportion of the electorate. But while this book suggests that much has been accomplished through farmer organisation, it also seems to indicate that, on balance, our farmers have stood to gain much more by making their desires known from the outside than by taking more direct political action. It is also quite clear that they have secured decided economic benefits by co-operating to carry on independent business activities. Finally, one must conclude that there has been increasing difficulty in obtaining and maintaining a really national farmer view-point. This is no doubt partly traceable to the lack of a general permanent educational policy and programme, to the distance factor, and also to the varying interests of farmers in different regions. In any case it is most significant that the Canadian Council of Agriculture, whose piecemeal formation and decidedly worthwhile accomplishments are discussed, has gone out of existence. The result is that to-day there exists no single organised body through which the viewpoints of the many separate agricultural organisations on *general* questions affecting the *entire* industry may find expression.

W. A. DRUMMOND

University of Toronto.

Agricultural Russia and the Wheat Problem. By VLADIMIR P. TIMOSHENKO. (California, Food Research Institute. 1932. Pp. xi + 571. $4.00.)

As is fashionable with writers on the Soviet Union, the author of this book first of all points out that " economic experimentation as it proceeds in the U.S.S.R. is a subject that arouses emotional as well as intellectual responses." This Ukrainian professor, who left the U.S.S.R. in 1919 and has not been back since, then goes on to say: " I have sought in this book, however, not so much to formulate my own view of agricultural developments and to persuade readers of its validity, as to present in a comprehensive form . . . the data." But, in fact, this book is as comprehensive a survey of Russian agriculture as is compatible with consistent deprecation of everything that has ever been thought, said, or done by the Bolsheviks. Such a criticism must be substantiated by facts. Let us turn to the facts.

There is much statistical material. Now, statistics are a purely quantitative measure, and give no indication of qualitative movements. An *average* production of grain per head that seems large does not preclude a large percentage of deaths from starvation.

This should be borne in mind when reading this book. Let us first of all consider the question of famine, which receives considerable prominence. In the Index references will be found only to one famine, that of 1921. In the whole text of the book only one reference will be found to any other famine but that of 1921. The reader who is not acquainted with Russian history will get the impression from this book that, except for one case of very little importance in 1891, Russia had one famine in its history. By reckoning in ten-year averages for pre-war periods, and by making no reference to pre-war famines, the writer creates here a wrong impression in the mind of the unwary reader. But what are the facts? That, almost every ten years, from the tenth century up to the revolution, famines occurred in Russia; and that, between these large famines, there were often local famines of considerable frequency. Thus, the Russian language contains two words in its vocabulary, "golod," for a famine of considerable dimensions, and "golodovka," for the smaller more localised famine.

In spite of the fact that the activities of the Soviet Government for the protection of the health of mothers and children have everywhere received wide recognition, and while the main feature of the fall in the death-rate of Soviet Russia has been the fall in maternal and infant mortality, due to what is undoubtedly a permanent improvement in health services, we find the *only* explanation for the fall in death-rate being given that perhaps it is "partially" due to the famine.

The facts given in this book bear witness continually to the drastic necessity for a complete reorganisation of Russian agriculture. But while the writer spends plenty of time on the difficulties accompanying this reorganisation, he never once admits that its purpose is sound, namely, finally to solve the problems of Russian agriculture; and he even sometimes completely ignores the fact that this process of reconstruction is taking place. Thus, we may quote this extraordinary example of blindness to what is going on. The book appeared in 1932. At the end of 1932 approximately 70 per cent. of the land of the U.S.S.R. under cultivation had been collectivised. On this area the three-field system had been completely eliminated. And this was not simply the work of one year, but had been going on since 1928, a process whose difficulties are fully described by the writer. And yet we find (pp. 202–3) a description of the three-field system in the present tense, with not the slightest suggestion that a substitute has been found for it, or ever can be found.

Another example of the writer's attitude to Soviet policy is the following. While dealing with the development of M.T.S. (Machine Tractor Stations) in the Soviet countryside in the last few years, he writes as follows: "These stations make contracts for ploughing with collective farms and individual peasants, on the condition that a certain percentage of the crop harvested on the land so ploughed is to be delivered to the M.T.S. In this way the M.T.S. has become important in gathering grain for the State. . . . This ingenious system for the control of the activity of millions of peasants through a few thousand M.T.S. with all the means of production in their control may reasonably be compared with the capitalistic organisation of manufacturing before the factory system developed. In those days an entrepreneur supplied small producers, working in their homes, with the means of production, on condition of the delivery of the products to him at a fixed price. The Soviet Government now seeks to apply to Russian agriculture a system analogous to what is described as a 'sweating system' of manufacturing in economic histories both capitalistic and socialistic" (p. 460).

This quotation gives such a perfect illustration of the "emotional responses" of the writer that it is worth quoting at length. Let us examine the activities, respectively, of the M.T.S., the Soviet State, and the contractor under capitalism, with regard to the producer. Taking the contractor under the household system first, we find that the only purpose of this individual was to get as much work as possible out of the workers. For this purpose they were supplied with everything, often including machinery as well as raw materials; they were then paid a miserable wage for the work they did, the product being entirely taken by the contractor.

But what occurs with regard to the Collective Farms? First of all, they are supplied with selected seeds and fertilisers and other forms of technical assistance by the State, in return for a certain part of the product. The services of the M.T.S. are supplied in return for a definite part of the product *in payment*. The rest of the product of the collectives belongs to them. Part of this is set aside for the next sowing, for fodder for live-stock and so on, and the rest divided among the members. At the present time the State takes its share in the form of a tax on the acreage under cultivation, the amount varying according to the productivity of the land and the degree of technical development of the farm concerned. Thus, the collectives not only have their products for consumption, but are actually encouraged to save

and to expand their cultivation on their own initiative, and thus to develop progressively, raising the standard of life of their members at the same time. It must be further stated that while the State levies a tax in kind on the produce of the farms, it also provides to the villages social services on a scale unprecedented in the history of Russia, thus giving something in return, which raises the standard of life of the peasants, but which is absolutely ignored by the writer of the book.

In considering Soviet Russia there are always different standpoints from which every question may be approached. The writer of this book has one of these standpoints. "The new forms of agricultural organisation, representing a very far-reaching change from the older system, are still not established. This may be seen from the fact that in the summer and autumn of 1931 the Soviet Government and the Communist Party themselves found it necessary to check further spread of collectivisation, and instead to proceed towards strengthening existing collectives in the direction of their better organisation . . ." (p. 500). From another point of view, however, the same fact might be formulated quite differently: "The new forms of agricultural organisation are now so *well* established that the Soviet Government and Communist Party have found it no longer necessary to press for further increase in collectivisation *quantitatively*, but to concentrate on improving the quality of cultivation over the large area already collectivised."

In the preface to this book the writer suggests that he is above the "emotional responses" called forth by a discussion on Soviet Russia. While claiming "not so much to formulate his own view," the whole standpoint of the book reflects that view. The writer of this book left Russia in 1919. Since then, either because the Soviet authorities did not allow him back, or because he himself did not want to return, or for both of these reasons together, he has not been in the Soviet Union. I have lived in the U.S.S.R. on and off for two years, because I wished to do so, and the Soviet authorities have raised no objection. It is natural, therefore, that each writer must have his own standpoint. The writer of the book claims to be above "emotional responses," and as any reader who believes this is likely to take much that is in the book without question, I have tried to show why readers should approach it with care.

P. A SLOAN

Land Problems of India. By RADHAKAMAL MUKERJEE, Professor of Economics and Sociology, Lucknow University. (London: Longmans, 1933. Pp. x + 369. 9*s*.)

LAND tenure is more complicated in India probably than in any country in the world. Customs governing the occupation of land vary from district to district; and each province has its own considerable body of land legislation differing, in some cases fundamentally, from other provinces. Primitive tribal customs literally thousands of years old have survived in some parts. Each successive wave of conquerors from the north-west introduced new customs in the parts where the invaders settled in numbers. Four hundred years ago came the organised land system of the Mughal Empire, which the British inherited, but in the last century overlaid with laws based on English ideas, and more recently based on the ascertained needs of the situation. Professor Mukerjee gives a good idea of this complexity and indicates the probable origins of many indigenous systems of tenure. His book, however, is not primarily a description of Indian land systems; for that task was undertaken by Baden Powell in his monumental work of three volumes, whilst the statutory law of British times is set forth in many legal works.

Professor Mukerjee is concerned with the effects of the laws and customs of the land tenure upon the efficiency of agriculture and the welfare of the peasants. The existing systems of tenancy, and the abuses which have grown up under them, are described in order to explain the reasons for the reforms which have been attempted and those which the author advocates. These are of great range and complexity; but everyone who studies the rural economy of India agrees that sweeping reforms are necessary to improve the economic position of the peasant, though opinions differ as to how they should be carried out.

The most serious evils, which are correctly described by Professor Mukerjee, are: the growth of landlordism and rack-renting, even in the provinces where the law recognises only peasant proprietorship; sub-infeudation, the land being let and sublet to five or six successive sub-tenants, only the last being the actual cultivator; the extreme subdivision of holdings, so that a family has to live on less than an acre of rice land, and individual fields are often no larger than a tennis court; the scattered nature of the usual holding with fields in ten to twenty places; the levying of premia and "fines" by landlords where rents are fixed by law; the pressure of land revenue on the small cultivator in some parts; and the usurious interest charged by

money-lenders, and failure of the land alienation acts wholly to protect cultivators from loss of their land.

The author considers at some length the problem of enlarging the multitude of uneconomic holdings, and of consolidating the holdings which consist almost universally of scattered fields. He is in favour of compulsory pooling and redivision of the land into compact holdings, and readjustment of village roads and paths, and easements, such as irrigation channels. The attempts to protect tenants by conferring occupancy rights and tenancies for life automatically acquired have been partially successful. Yet there is a host of tenants at will who frequently have to shift, and of protected tenants having holdings too small to maintain a family. These classes might be provided for to a large extent by Government purchase of the large *zamindaris*, or landlords' estates, and sale to the peasants by gradual instalments on the Irish plan, after laying out the land to the maximum advantage. The permanent settlement is reviewed by the author, and its baneful results are indicated. The proportion which land revenue bears to rent and to the cultivator's surplus is examined; but, since most of his proposals are sound, it is rather surprising to find the author proposing that the land revenue should be reduced for cultivators with very small holdings on the principle of ability to pay. This confuses a tax which takes a share of the economic rent with an income tax; and in any case it would prove extremely difficult from the administrative point of view.

In several places the author's inferences from the experience of other countries seem to need reconsideration; but the book forms a useful and suggestive review of the agrarian problems of India and of possible methods of alleviation. Numerous vernacular words are used for different tenures, tenure-holders and customs without any translation or explanation; and the book as a whole has been written for those already conversant with the main features of Indian rural economy.

H. S. JEVONS

Industrial Labour in India. By S. G. PANANDIKAR, M.A., D.Sc. (Longmans, Green & Co. 1933. Pp. 299. 9*s*. net.)

THE protection of factory and plantation labour in India is a problem that has been, ever since the end of the Great War, a subject of considerable study in official and unofficial circles in that country. Much and far-reaching legislation was enacted in the years between 1921 and 1927, and later a Royal Commission,

presided over by Mr. Whitley, made an exhaustive examination of the whole position. The report of that Commission provides a final and authoritative account of the prevailing conditions and must be the starting-point of all future investigations. No serious student can afford to neglect it.

The general reader will find that Dr. Panandikar's work supplies much of the information collected by the Royal Commission in a readily accessible form. He has made a careful and painstaking study of the conditions of employment in all the major industries. This is followed by a summary of existing legislation and a programme of further legislation recommended by the Commission. Questions affecting the efficiency of Labour, such as health, housing and welfare, are then discussed. A chapter is devoted to wages and standard of living. Useful as such a treatise undoubtedly is, it is somewhat too ambitious and endeavours to cover too wide a field. While relying on previous works on the same subject, the author also claims to have had opportunities for making personal investigations, but it is not always easy to ascertain exactly when he is utilising his own inquiries. Students will be disappointed to find that there is no bibliography.

"The aim of the book," Dr. Panandikar writes, "is to show that the main obstacle to the industrial and economic progress of India is the absence of an efficient, steady and contented labour force; that it can be largely overcome in a few years by the adoption of certain measures." This seems altogether too optimistic a view: those who have spent many strenuous years in India in the effort to ameliorate conditions know that progress is bound to be slow. They are aware of the dead weight of opposition from different quarters that has to be met before any appreciable advance can be made, even with regard to comparatively simple legislative measures. The illiteracy of the workers and their own conservative ideas are yet other obstacles which cannot be overcome in a few years. An uneducated labour force is very weak and is also a grave potential danger.

Certain rather strange statements regarding labour legislation and trade unionism occur in the course of the book. "The former," Dr. Panandikar writes, "is apt to reduce the spontaneity and adaptability of the private efforts of employers for the improvement of the lot of the workers, and, as it must generalise so as to be able to influence large areas and numbers, it may cause injustice to individual cases"; while "the great drawback of trade-unionism is the danger of serious conflict between the workers and their employers." He goes on, however, to state that "the

balance of gain " in each case is in favour both of labour legislation and trade-unionism. But when dealing with these subjects in greater detail, Dr. Panandikar clearly shows that he realises the advantages that labour has gained through them.

The chapters on Labour Legislation already need revision, as considerable advance has been made within the last year. Many important recommendations of the Royal Commission, which were only at the stage of being bills or proposals when the book was written, have either since been duly enacted or have made considerable progress in the Legislature. The important Factories Bill, for instance, which was then only in a draft form, has been accepted in principle by the Legislature and referred to a Select Committee. The bill relating to deductions from Wages and Fines has been formally circulated for opinion. Bills which have since become laws are the Workmen's Compensation (Amendment) Act, the Act prohibiting the pledging of the labour of children and the Land Acquisition Act. These measures will have an appreciable effect on factory conditions and on the welfare of the workers, and will render obsolete many of the author's observations on present conditions.

A peculiar feature of Indian factory organisation is the existence of " jobbers," or overseers, who combine some of the functions of foremen with the power of engagement and dismissal. This system naturally leads to many abuses and is rightly condemned both by Dr. Panandikar and the Royal Commission. The recommendation of the Royal Commission that educated labour officers should be appointed in their place is endorsed by Dr. Panandikar, but this recommendation does not take into account the various languages spoken by the workers in an Indian factory. The establishment of Employment Exchanges, on the other hand, in the different provinces—a far more effective way of breaking the power of the jobbers—was not recommended. The Royal Commission even goes so far as to state that " we do not think that it would be wise to start them at a time when most factory owners can find sufficient factory labour at their gates." The reason advanced for their non-establishment in India was the very reason for their establishment in England—so great is the difference of the view-points in the two countries.

On the whole, Dr. Panandikar's work deals with industrial conditions in India in an impartial manner and we may confidently express the hope that it will help to educate public opinion in that country. In that way it may ultimately be possible for the workers of India to enjoy a status and conditions more in con-

sonance with her position as one of the chief industrial countries of the world.

G. M. CHATTERJEE

A Hundred Years of Inland Transport, 1830–1933. By C. E. R. SHERRINGTON. (Duckworth, 3 Henrietta Street, W.C. 2. Pp. 376. 15*s*.)

IT may be said with sufficient accuracy that modern transport began a hundred years ago, since Shillibeer ran the first omnibus in London in 1829, and the Liverpool and Manchester Railway was opened in 1830. Railways of a kind were known long before this; wagons were dragged over strips of wood or plates of metal. Some people, indeed, trace the curious width of our railway gauge —4 feet 8½ inches—to the width of Roman chariot wheels. Steam railways meant the eclipse of canals, and, after a time, the extinction of stage-coaches. It is not true to say that railway companies strangled the canals; Parliament forced them to buy up the older form of transport; which is much like forcing taxi-cab proprietors in London to buy up the old "growlers" and hansoms.

Railway rates were based on canal rates, and both on a classification of goods by value, not on the cost of service. Nowadays the whole system of railway rates, and indeed of transport economics, is challenged by the road motor vehicle, "whose operators base their charges mainly on the cost of movement irrespective of the value of the goods transported."

In this interesting volume Mr. Sherrington points out that the road haulier, being free from the obligations imposed by Parliament on the railways, can offer "much lower rates than a competing railway for high-grade goods which load well and can be easily handled." In this way the road vehicle tends to keep up the charges for goods which the railway must haul, such as export coal, minerals, or meat in bulk from the docks. Since the Railways Act of 1921 made the trading and travelling public the senior partners of the railway shareholder, it is not really true that road transport means cheap transport. If traffic returned from the roads to the railways in such quantities as to yield more than the standard revenue as fixed by the Act, the railways would have to give back four-fifths of the gain to the public in lower charges, just as they now give back three-fourths of their de-rating allowance in lower charges for certain classes of heavy goods.

Some controversies which raged last century have been settled; Mr. Sherrington supports the victor in the Battle of the Gauges, though he admits that Brunel's 7-feet gauge had certain advan-

tages, and he recognises Brunel's genius as an engineer. The place of competition in transport is not yet settled; Victorian England believed in competition between the big railway companies and refused projected amalgamations, and even pooling schemes. Since the war Parliament has changed its policy entirely, and is now forcing amalgamation on all kinds of industries which do not want it. A new controversy centres round the taxation of the road motor vehicle. Ought it to pay for the *use* of the roads as well as for the damage it does to them? Is the petrol duty a payment of a toll for the use of the roads, or a protective duty on imported fuel? Are the licence duties on the heavier commercial vehicles and on the omnibuses heavy enough? Mr. Sherrington discusses these questions, but does not answer them.

A large part of the book is taken up by detailed accounts of how the innumerable small local lines were gradually linked up to form a truly national system of communications. Competition certainly involved some waste and a good deal of duplication; however, it had its uses in securing continuous improvement in the service offered to the public. Mr. Sherrington has much to say about technical improvements in railway working which make travel faster, safer, and less fatiguing. Our modern express services depend on the vacuum brake and the automatic signal. It is noteworthy, though Mr. Sherrington makes little of it, that the enormous improvement in the service offered to the public has not been accompanied by any increase of charge. A traveller pays no more for a seat in a corridor express than his grandfather paid for a board in a cattle-truck.

As for the Railways Act of 1921, Mr. Sherrington is amazed at the want of foresight shown by its sponsors, who could not see that the motor vehicle was already revolutionising transport; still he thinks that, on the whole, it was "a successful piece of legislation." Tramways, he says, cannot be neglected as a convenient and cheap form of urban transport, though he has leanings towards the trackless trolley-bus. The change from horse to electric traction took a long time; why was the petrol-driven tram not given a trial in this country? One would like to know the real difference in cost between carrying a given number of passengers between two points (*a*) by tram and (*b*) by motor omnibus, if the omnibus were charged, like the tramcar, with the cost of its track. Altogether this book is written with the detailed knowledge of transport questions which one expects from Mr. Sherrington.

J. E. ALLEN

The Professions. By A. M. CARR-SAUNDERS and P. A. WILSON. (Oxford University Press. Pp. vii + 356. 25*s*.)

THE place and function in society of professional associations is a subject of great interest and importance to the ordinary member of the public no less than to the political theorist. The latter takes the position of associations within the State as a fundamental theme, a theme the perennial urgency of which has been clearly demonstrated by recent European events. The former is constantly drawn to the discussion of those practical problems which relate to professional organisation and the availability of professional services. Public medical service, legal aid for the poor, the place of professional education in universities; such problems as these cannot fail to receive wide attention.

But while interest both in the organisation and status of professional organisations is widespread, informed guidance upon these problems is conspicuously lacking. And until all that is characteristic of professionalism is clearly set out and critically examined, little is usefully possible in the way of generalisation or policy-making. It is to supply this need that Professor Carr-Saunders and Mr. Wilson have made this pioneer survey. They themselves depict very adequately the background from which such a book takes its value.

> "Not only is there no widespread acquaintance with the organisation of the professions, but there is the greatest divergence of view about the value of professionalism and of all for which the professions stand. To one writer of great authority and influence they are objects of deep suspicion; to another, of less authority but of much influence, they are 'conspiracies against the public.' On the other hand, in the view of an author whose political affiliations are the same as those of the writers to whom allusion has just been made, the professionalisation of business is one of the most promising methods of social reform. This state of affairs is to be explained, at least in part, by the fact that information about the professions is almost wholly lacking. . . . Until many investigators, approaching the subject from different angles, have worked upon it (professionalism), generalisations can have little behind them; and such opinions as those to which we have referred can be no more than expressions of like or dislike of certain aspects of professionalism which, from lack of investigation, may not have been thoroughly understood."

The first part of the book surveys a wide field of twenty-six professional bodies. No association is omitted, except the Church and the Army, which by reason of lineage, custom, State action or voluntary development can claim professional status. Part II traces the history of the emergence of professions since early mediæval times. As a comprehensive description of their subject these two sections of the book are unrivalled.

Parts III and IV are an analysis and evaluation of professional organisation and activities, and a study of questions concerning the place which professions might occupy in the society of the future. Here, there is set out a body of observations on their habits and conduct which the professions would do well to take to heart. Particularly is this the case with the medical and legal professions, whose standards and organisation are subjected to a very searching criticism.

It seems ungrateful to ask for more from a work which provides so much, but it is, nevertheless, a pity that some of the problems discussed were not treated comparatively. For there is a wealth of significant foreign experience in this field which could have been used to illustrate the authors' results. In law, medicine and teaching, in particular, a number of conclusions as to English practice might have been drawn from a consideration of the experience of the same professions abroad. There are, for example, in the United States, no closed corporations like the Inns of Court. One would like to know whether it is that fact which makes it possible for the great American law schools to exert the influence they do in promoting legal reform. Again, the recognised status of the French teacher is considerably higher than that of the teacher in England. Is there any connection between this fact and the absence in France of the British dual system within which State education is largely a provision for those who cannot afford the "superior" article?

In view of the fact that the political theorist is mentioned in the preface it might have been as well if the whole question of freedom of teaching and self-government for associations had been examined in the light of recent experiences in Russia, Italy and Germany. What problems of freedom, for example, arise for the university teacher and what happens to his organisation when universities become State-controlled? What would be the reaction of the senior common rooms of self-governing Oxford and Cambridge to the technique of an English Goebels?

There is one further and deeper criticism of the book. One is not conscious that the authors have brought any considered

social philosophy to bear upon their subject. No work of this kind could fail to convey, in part, the impression that many of the characteristics of professionalism are the direct or indirect result of social inequality. No one can escape the conclusion that rules of entrance, methods of government, tests of competence, relationship to change, that these aspects of professionalism are and must be influenced by the fact that there are in society classes to which, for the most part, the door of the professions is closed. The authors do, in fact, come near to a discussion of this fundamental of their subject when they insist that "the building of bridges between Knowledge and Power is the first necessity." But they do not go on to link up, in any definite way, the practices they criticise with that inequality of access to the professions which is the necessary implication of an unequal society.

Professor Carr-Saunders and Mr. Wilson have made a large number of particular suggestions which the public and the professional world ought not to neglect. But they do not let us see whether they possess a social philosophy of their own, nor, apparently, do they use it as a basis for evaluation. They are, for example, able to point out the absence of an organised relation between the legal profession and the problems of legal change. But they do not go deeper to show us why such a state of affairs should exist; they do not refer us back to the inevitable relationship between law and the economic foundations of society. Which is a pity, for along that path some significant implications might have arisen.

But when all this has been said it remains true that the authors have performed a task of very great value. The issues which arise out of the relation of the expert to society are many and important. With this book it is possible, for the first time, to approach these issues with informed guidance. Those concerned with the development of opinion and policy with regard to the professions can afford to neglect neither its material nor its conclusions.

W. A. RUDLIN

Elementary Statistical Methods. By E. C. RHODES. Studies in Statistics and Scientific Method, edited by A. L. BOWLEY and A. WOLF. No. 1. (London: George Routledge & Sons. 1933. Pp. 243. 7*s.* 6*d.*)

MR. RHODES appeals to the common-sense of the reader, not to his mathematical abilities. Yet he succeeds in leading his reader gradually to problems of a more and more technical nature.

In the introductory chapters on Statistical Inquiries, Data, Desired Statistics, he shows in a persuasive and vivid manner some of the pitfalls which are frequently met with when collecting and interpreting statistical material. He proceeds to the theory of Averages and Measures of Dispersion and concludes with the Time Series. As the subject becomes more technical the treatment grows more concise. The weighted and moving averages are treated with pedagogical mastery. I am sure that the same might have been said of paragraphs on a few further elementary methods useful in practical work, if Mr. Rhodes had written them. Thus, paragraphs on scatter-diagrams (such as used by Mr. Rhodes himself in the recent February issue of *Population*), free-hand interpolation, computing the mode, might well have been added. The necessary space could be gained by making the first chapters slightly more concise and by leaving more to the common-sense of the reader and to practice. It must, however, be borne in mind that the book under review, "definitely intended as a first study," is not designed to serve as a reference book but rather to be actually read chapter by chapter. There is still no *communis opinio* as to the limits of what may be legitimately called "Elementary Statistics." Of the five or six text-books published in the last three years, some of the more advanced claim to have "introductory purposes" only (G. R. Davies and W. F. Crowder), or to presuppose only that amount of mathematical knowledge as is possessed by any "person of general culture" (Felice Vinci). Yet they serve purposes quite different from this book. For a beginner who may safely be supposed to have forgotten his school algebra it is at any rate preferable to get at first a broad presentation of the subject than to be awestruck at the outset by an array of mathematical symbols, thus being led to mistaking means for aims.

A few remarks may be added. I doubt whether Mr. Rhodes is right in insisting (pp. 98–99) on the necessity of confining even non-smoothed histograms to continuous measurements only, thus making the graphical representation of the total sum by an area sometimes impossible. My two concluding remarks, made from an economist's point of view, refer to Mr. Rhodes' as well as to most other modern writers' text-books on Statistics for the use of economists. First: the reasoning on Price-Indices is mostly based on the well-known formal tests of the kind of those systematised by Irving Fisher. The formulæ of Laspeyre and Paasche are quoted among others. But the text-books omit to make use of the fundamental discovery made by Pigou as early as 1912

and corroborated later by Haberler and Keynes (the strict proof was given by R. G. D. Allen in *Economica*, 1933, pp. 200 *seq.*): the two formulæ mentioned above give respectively, under condition of unchanged tastes, one the upper, the other the lower limit of any Price-Index claiming economic significance. Second: the decomposition of time-series. In spite of a generally professed scepticism towards the notion of "trend," this notion seems more and more to acquire a permanent place in the body of doctrine. Yet it would be possible to show the reader (by using exactly the same formal methods as with "trends") how to eliminate, not these merely abstract "time-influences," but those concrete economic influences supposed to be relevant to the particular problem under consideration.[1]

J. MARSCHAK

Methods of Statistical Analysis. By GEORGE R. DAVIES and WALTER F. CROWDER. (New York: John Wiley and Sons. 1933. Pp. 355.)

THE scope of this account of the statistical technique required in the social sciences is rather more limited than the authors appear to claim. They are, in effect, concerned largely with the statistical methods which apply to accurate or complete data of the kind given in "blue books" and, in particular, with methods of treating time series and of constructing index-numbers. Very little attention is paid to the specific problems that arise when the material analysed is in the form of a sample. Sections are devoted to averages, dispersion, index-numbers, time series and correlation and, in each section, the more elementary processes are separated from the supplementary or special methods. The general practice, also, is to give only formulæ in the text, relegating the majority of the mathematical proofs and developments to an appendix.

Even after allowance is made for the unavoidably heavy nature of the subject-matter, the general impression of the present reviewer is that the style and method of presentation adopted by the authors is unsatisfactory and lacking in inspiration. It is not always clear, for example, what is being proved and what is merely stated with a proof somewhere in the rather sketchy appendix of mathematical notes. Again, some of the terms used are introduced casually without any adequate definition of their meaning; the term "regression line" is a

[1] Cf. O. Anderson in the *Journal of the Royal Statistical Society*, 1927.

case in point. But the main criticism here is that the whole development is seriously overweighted with descriptions of involved processes of numerical computation at the expense of the basic theory. In a non-specialised work of this kind it seems preferable to emphasise the essential theoretical background of the statistical methods together with the more straightforward methods of computation. It is better that the student should know exactly what he is doing even if it takes him somewhat longer, at first, to carry out the actual numerical calculations. If he is at all competent, he can be left to devise, or to acquire from various sources, the methods of computation most convenient in his own particular field.

In details, also, there are a number of surprising omissions. Many readers will look in vain for an adequate treatment of weighted averages, from their use in such processes as the standardisation of death rates to their application in the weighted-relative method of constructing index numbers. It is, however, scarcely fair criticism to remark on omissions of this kind. The needs of research workers who use statistical methods, even in the limited field of the social sciences, are so diversified that no book of this size can possibly satisfy even a majority of them.

R. G. D. ALLEN

NOTES AND MEMORANDA

The Cost of Living of Girls Professionally Employed in the County of London

Women, it is often said, do not attempt to live on their salaries. Unlike men, they are but rarely entirely self-supporting; instead they rely, if unmarried, on their parents for some financial assistance; if married, and still working, they are partly supported by their husbands. Women, so it is argued, regard their earnings as "pocket-money." This description is usually taken to apply especially to the economic position of young unmarried girls, working in commercial and professional occupations, and who are assumed to come from middle-class homes. Here, it is pointed out, the parents are most probably in a position to provide their daughters with free board and lodging, even if they cannot afford to give them a dress allowance.

For some time I have wondered if this is a true description of the position. I was inclined to believe that, at any rate since the Trade Depression, many parents, in all classes of society, have not been able to assist their daughters financially. My own impression was that girls to-day are much more dependent on their salaries than is popularly supposed. Such being my belief, I turned to look for data on which to check my own impressions. I found, however, that very little was known about the position of girls in non-industrial jobs. The girls rarely belong to Unions, from which information could be obtained. Budgets of income and expenditure are seldom seen. Miss Collet published in the Economic Journal in 1898, a few accounts from professional women—but conditions have so altered since these budgets appeared that they can no longer be considered as typical. I realised that I should have to collect the necessary data myself, if I wanted to discover whether my impressions were correct. I therefore undertook an investigation into the cost-of-living of women working in professional and commercial occupations. The results of this investigation form the subject of this article.

The inquiry was conducted in the following way. I interviewed unmarried girls between the ages of twenty and thirty years, working in non-industrial occupations in the County of London. This particular age-group was chosen because it appeared

most likely that girls in the group would have similar types of expenses. If the age-limit had been extended to thirty-five or forty years, women would have been included in the inquiry who were beginning to save for their retirement. Girls under thirty do not usually reckon saving as one of the items they have to budget for, unless they are in jobs where there is an automatic superannuation deduction; furthermore, the background of the older women might have been considerably different from that of the younger girls. Their homes might have been broken up, their parents older and less able to help them. Their problems would be different. They are not the girls usually referred to in popular conversation on business girls. The lower age-limit was set at twenty because it is assumed that few girls under twenty would be earning salaries on which it would be possible to live, even if they wished to do so. Girls between the ages of seventeen and twenty are usually paid on a trainee basis, as their salary is supposed to be "pocket-money."

The girls interviewed were asked to state their annual income, distinguishing between earned and unearned, and to give a detailed account of their weekly expenditure over a period of four weeks. The amounts spent on items that were not included in the weekly budget, such as clothes, holidays, and medical attendance, were given in terms of the expenditure of the previous year (1932). Any savings were also calculated in this manner. The girls were also asked to describe how they spent their leisure time, both during holidays and during the working week. A number of rooms, hostels, and flats, in which the girls lived, were visited. In this way an insight into the actual lives of the girls was obtained.

The choice of girls for interview was determined by personal opportunity, as the investigation was carried out on an informal basis. No limit was given to the size of the income. The budget of any girl who was known to come from a middle-class home (*i.e.* parents' income over £225), and was engaged in earning her living in a non-industrial occupation, was accepted. The investigation resulted in the collection of fifty budgets; seven of these had to be discarded owing to the inadequacy of the information offered.

Though the sample obtained was small, I think it can be regarded as giving a fairly representative picture of the cost-of-living of girls of that particular age-group, working in commercial and professional jobs. The investigation, though carried out on a small scale, covered a wide occupational area. Budgets were obtained from girls working in all the most important jobs that

come under the heading of commercial and professional in the Census. Administrators in the Civil Service, teachers, dispensers, journalists, copy-writers, mannequins, librarians, and film-workers were interviewed; while in the commercial occupations, budgets were obtained from typists, filing-clerks, saleswomen, hairdressers, manicurists, telephonists, dress-makers, programme-sellers, and lift-girls. All the budgets were checked over personally with the girls interviewed; a high degree of accuracy was thereby obtained.

The results arrived at from an analysis of the budgets did not bear out the popular conception of the financial dependence of this type of girl on her family. Of the girls who were living at home (thirteen in all), two only paid nothing out of their salaries for board and lodging—these two girls regarded their earnings as pocket-money only; but they were the exception. The remaining eleven paid their families a weekly sum, sufficient to cover at least their food, and, in some cases, a share of the rent as well. True, none of these girls who were living with their parents can be considered to be entirely self-supporting, since it is doubtful if their payments into the home covered altogether the cost of their board and lodging—but, as will be seen in the table of budgets given below, the weekly payments took a considerable proportion of the girls' salaries; they must be considered as being almost financially independent.

The total number of girls living on their own was thirty. Three girls from this group had parental subsidies in the shape of dress allowances. The rest were completely self-supporting. They received no direct subsidy from home, either in cash or kind. But the fact that they had homes behind them entered into their calculations to some extent. Any exceptional expenditure, such as a sudden doctor's or dentist's bill, was often paid by parents. This was particularly the case amongst girls whose salaries were either just above the health insurance limit, or who, though coming under the insurance scheme and paying weekly contributions, disliked appearing as panel patients. Holidays, in some cases, and week-ends nearly always, were spent either at home, or with friends or relatives. These were the only ways in which the girls received help from home. I think this group may be considered to be self-supporting.

The purpose of my inquiry was two-fold. First to discover the proportion of women in my sample who were self-supporting, secondly, to find out what was the cost-of-living for these independent people. The results of the second part of my investigation

are summarised in the following tables. As this section deals only with girls who are either entirely self-supporting, living away from home, or who, though at home, pay for their board and lodging, I have eliminated from the tables all the budgets of girls having dress allowances from home, or who are not contributing towards the household's expenses.

For the purpose of analysis it was decided to average the budgets; but as the extreme limits of income were very far apart —the maximum weekly income was £5 5*s*., the minimum £1 5*s*.— to have attempted to produce an average budget from incomes that differed to such a degree would have resulted in obtaining averages of little meaning. The budgets have been placed in income groups, and an average budget has been made from each group. As the data thus obtained did not give a continuous frequency curve of incomes, discontinuous groups were taken. The budgets fell naturally into the following groups.

Weekly income.	Number of budgets.
25*s*. and under 45*s*.	11
50*s*. „ 60*s*.	7
60*s*. „ 75*s*.	11
80*s*. „ 85*s*.	4
100*s*. „ 110*s*.	5

TABLE I.

Average Budgets of Income and Expenditure

Weekly. Income	25*s*. and under 45*s*.	50*s*. and under 60*s*.	60*s*. and under 75*s*.	80*s*. and under 85*s*.	100*s*. and under 110*s*.
	s. *d*.	*s*. *d*.	*s*. *d*.	*s*. *d*.	*s*. *d*.
Rent	8 10	14 3	18 3	17 3	22 6
Light, heat	2 8	3 0	4 5	3 10	4 8
Food in	6 10	10 2	10 10	10 1	13 3
Food out	3 10	8 2	8 3	9 0	10 3
Fares	1 8	2 6	2 0	2 6	2 9
Insurance	1 5	1 2	1 3	—	—
Laundry	7	1 3	1 0	2 0	2 0
Sundries	1 8	3 4	5 0	10 0	10 1
All expenditure	27 6	43 10	51 0	54 8	65 6
Annual.	£ *s*.	£ *s*.	£ *s*.	£ *s*.	£ *s*.
Clothes	12 0	15 15	18 0	30 0	35 0
Holidays	7 15	8 7	11 0	20 0	22 0
Savings	—	—	4 0	5 0	11 0
Medical	—	—	—	5 0	5 0
Income tax	—	5	3 0	9 2	13 10
All expenditure	19 15	24 7	36 0	69 2	86 10

As the expenditure of the girls who lived at home differed in detail, though not in amount, from that of those who lived on

their own, for clarity of tabulation I have put their averaged budgets in a separate table (see Table II). As regards the details

TABLE II.

Average Budgets of Income and Expenditure.

Weekly. Income	25*s.* and under 45*s.*	50*s.* and under 60*s.*
	s. *d.*	*s.* *d.*
Board at home	12 8	16 7
Lunch out	4 5	4 9
Fares	3 8	3 4
Insurance	1 0	1 3
Sundries	2 6	6 6
All expenditure	24 3	32 5
Annual.	£ *s.*	£ *s.*
Clothes	15 10	24 0
Holidays	7 13	21 0
Savings	—	7 0
Medical	—	—
Income tax	—	10
All expenditure	23 3	52 10

of the budgets, rent includes payment for domestic service, and some laundry. It is the custom for landladies to provide linen and service in furnished rooms, and to include the charge in the rent. "Food in" covers the amount of food eaten for breakfast and supper. "Food out" includes lunches, tea and morning coffee. "Fares" covers the cost of travelling to and from work. "Sundries" includes all expenditure on toilet accessories, amusements, week-end travel, presents, and other miscellania.

The most notable feature in the first budget (Table I) is the small amount spent on food. This is partly explained by the fact that nearly all the girls in this group were sharing rooms. Catering for two appears more economical than catering for one. Also lunch usually consisted of home-made sandwiches and a cup of coffee; sometimes food was supplied at cost price by the offices and stores where the girls worked. It is, however, very doubtful if these girls really do get enough to eat. The second budget shows an increase in all expenditure, as indeed one might expect; but, in the three remaining groups, expenditure on food and rent does not appear to vary very much with the size of the income. Round about £2 covers the cost of these items in all three budgets. The difference in expenditure is shown in the varying amount spent on clothes and holidays and sundries. The limit to the amount that a girl can eat is soon reached, but it is doubtful if her desire for clothing is ever satisfied.

In all groups there were some budgets that varied con-

siderably from the mean. Some girls who were sharing flats did all their own cleaning, and spent the extra money on furnishing. Others economised on rent, and spent more money on travel. Some spent little on clothes and much on amusements. In the lowest-salary group there was, however, but little variation.

A comparison of the budgets of girls living at home with those of girls living on their own does not bring out any remarkable reduction in the cost-of-living in the lowest salary group; but presumably the girls living with their parents get more for their money, by sharing in the family life, than do the girls who are living away. The girls in the second income group score considerably from the financial point of view by staying at home. The cost-of-living for them is so reduced relatively to that for girls with similar incomes living on their own that they have a considerable surplus to spend on clothes, etc. In fact, their expenditure on these items is almost in the same class as that of girls earning £4 a week.

As regards the method of living, it was found that girls with the smallest salaries (twenty-five shillings and under sixty shillings weekly) preferred to live at home, on the grounds of economy. Even when payment into the home and the additional cost of travelling were taken into account, this way of living appeared to cost slightly less than lodging in London. Furthermore, the daughter's weekly contribution was a considerable help in balancing the family budget. Parents encouraged the girls to stay at home. When the conditions of their work forced them to live away, they chose either small bed-sitting-rooms, which they shared with a friend, or they boarded in cheap hostels, sleeping in cubicles and eating in the common dining-room.

Living at home was not so popular amongst the girls in the upper salary groups (sixty shillings and under one hundred and ten shillings a week). Only three girls out of the twenty-two in these three groups lived with their parents. No average budget has been taken of the expenditure of these three girls; as explained above, two of them paid nothing towards their keep. It was thought that too few budgets were collected in this group to enable a representative average to be taken.

The girls who lived on their own in London, rented either bed-sitting-rooms or flats; the latter they shared with friends. The boarding-house habit, so commonly met with in accounts of nineteenth-century life, appears no longer to be popular. Most girls preferred flats, but lived in sitting-rooms, furnished, either because they had no friend to share with, or because they could

not afford the cost of furnishing. The girls bought and cooked their breakfasts and suppers, getting their mid-day meal at a restaurant. The cooking apparatus was usually a gas-ring—gas was supplied from a penny-in-the-slot meter. Bathrooms were shared with other inmates of the house.

Life in a flat was evidently very similar, though one had more freedom and more privacy. Cooking was easier, gas cookers being used instead of the ubiquitous gas-ring of the furnished room. The expense worked out about the same as renting a room, assuming the flat was shared between two people. The actual rent was lower, but service was more, and in some cases weekly instalments on the furniture bought on the hire-purchase system had to be allowed for.

The type of amusement found to be most popular with the girls in the lowest salary groups was cinema-going. Most girls managed to spend a shilling a week on the "pictures." Reading novels taken from the free libraries or the "Twopenny-book-shops" was the other source of amusement amongst girls who could spend only a few shillings a week on recreation. In the higher grades of income, riding, skating and theatre-going appeared to be the normal amusements. Dancing did not appear popular amongst any of the girls.

The type of holiday varied tremendously amongst those who had over £10 to spend. "Hiking" both in England and abroad, travelling with parents, staying at home, were all popular; but it was found that the girls who had £6 for their holidays nearly always went for a week by the sea, if they did not stay with relations. Everyone appeared to have some kind of holiday once a year.

Such was the information on the manner of living and the cost thereof to business women, obtained through my investigation. There is still much to learn about the life of the middle classes. Present-day statistical data are very inadequate on this subject. This small-scale inquiry is an informal attempt to throw some light upon the life of at least one section of the middle classes—"the black-coated woman worker."

RUTH BOWLEY

The Equilibrium of Duopoly

I propose a solution of the problem of duopoly in a perfect market [1] on the arbitrary assumption that the particular demands, with which each duopolist is confronted, are linear functions.

Represent the market demand by $F(x)$ and the particular demands by which the first and second duopolists are confronted by $f_a(x_a)$ and $f_b(x_b)$. It is required to determine the values of f'_a and f'_b, the cost functions of the duopolists and the market demand being known.

The fall in the market price, due to the first duopolist increasing his output by Δx, is equal to the fall which occurs when the total supply is increased by an amount, Δx less the amount by which the second duopolist restricts output in consequence of such a fall in price.

When the first duopolist increases output by Δx, the demand curve of the second duopolist moves to the left by an amount equal to Δx throughout its range. If this demand curve has a linear function, the gradient of the marginal revenue curve correspondent to it may be represented by the expression $2f'_b(x_b)$.[2] Consequently, when the second duopolist's demand curve recedes by Δx throughout its range, his correspondent marginal revenue curve recedes by $\frac{1}{2}\Delta x$.

If $\phi_b(x_b)$ represents the cost function of the second duopolist, his restriction of output consequent on the increase of that of the first by Δx is

$$\left\{\frac{2f''_b(x_b)}{2f'_b(x_b) - \phi'_b(x_b)}\right\}\tfrac{1}{2}\Delta x \quad [3]$$

[1] The expression perfect market is used to indicate the rule of a single price and the absence of competitive marketing costs, in contradistinction to perfect competition when particular demand curves have infinite elasticity.

[2] The gradient of the marginal revenue curve is equal to

$$\frac{d\dfrac{d(x_b y)}{dx_b}}{dx_b}$$

When the second differential is zero, this expression $= 2\dfrac{dy}{dx_b}$.

[3] In these figures the cost curve intersects the old marginal revenue curve (MR_1) at P and the new marginal revenue curve (MR_2) at Q. The horizontal distance between the MR curves is $\frac{1}{2}\Delta x$. The restriction of output in Fig. 1 is QR, that in Fig. 2 is PR. In Fig. 1 QR is equal to

$$\frac{\tan\beta}{\tan\alpha + \tan\beta}\cdot\tfrac{1}{2}\Delta x = \frac{2f'_b(x_b)}{2f'_b(x_b) - \phi'_b(x_b)}\cdot\tfrac{1}{2}\Delta x.$$

In Fig. 2 PR is equal to

$$\frac{\tan\beta}{\tan\beta - \tan\alpha}\cdot\tfrac{1}{2}\Delta x = \frac{2f'_b(x_b)}{2f'_b(x_b) - \phi'_b(x_b)}\cdot\tfrac{1}{2}\Delta x.$$

Thus the same expression serves for both cases.

Consequently the net increase of output is

$$\left\{1 - \tfrac{1}{2} \cdot \frac{2f'_b(x_b)}{2f'_l(x_b) - \phi'_b(x_b)}\right\}\Delta x = \left\{\frac{f'_b(x_b) - \phi'_b(x_b)}{2f'_b(x_b) - \phi'_b(x_b)}\right\}\Delta x.$$

Therefore the particular demand for the product of the first duopolist is shown by the equation

$$f'_a(x_a) = F'(x)\left\{\frac{f'_b(x_b) - \phi'_b(x_b)}{2f'_b(x_b) - \phi'_b(x_b)}\right\} \quad . \quad . \quad . \quad (1)$$

Of these terms, $F'(x)$, the gradient of the market demand curve, and ϕ'_b (x_b), the gradient of the second duopolist's cost

THE SECOND DUOPOLIST

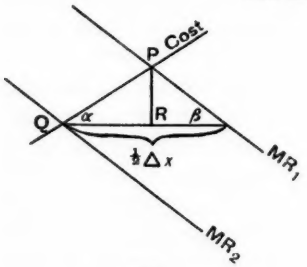

FIG. 1
(Increasing Cost).

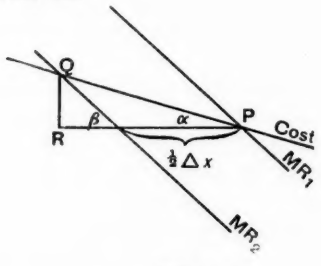

FIG. 2
(Decreasing Cost).

curve, are known; f'_b is, however, unknown. But for this we have a second equation analogous to (1) above.

$$f'_b(x_b) = F'(x)\left\{\frac{f'_a(x_a) - \phi'_a(x_a)}{2f'_a(x_a) - \phi'_a(x_a)}\right\} \quad . \quad . \quad . \quad (2)$$

Thus we have two unknown quantities and two equations with two roots for each unknown.

If the gradients of the particular demand curves, f'_a and f'_b, are known, the determination of the duopolists' position becomes a simple matter. It is required to find the price (y) and the amounts produced by each duopolist, x_a and x_b. For these three unknowns we have three equations.

$$y = F(x_a + x_b) \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (3)$$
$$= \phi_a(x_a) - x_a f'_a(x_a) \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (4)$$
$$= \phi_b(x_b) - x_b f'_b(x_b) \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (5)$$

Equations (4) and (5) express the fact that each duopolist equates his cost to his marginal revenue.

If more complicated particular demand functions are allowed, the mathematics becomes less tractable. But there does not

appear to be any reason of economic principle for supposing that the equilibrium of duopoly would on normal assumptions be any less determinate.

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FISHER'S REAL RATE DOCTRINE

THE " real rate " of interest which is generally associated with the name of Fisher is really a much older notion. Fisher's is, however, the best prevailing version of it, fully elaborated to explain industrial fluctuations. We have been brought up to respect it as *one* possible explanation of the phenomena of fluctuations. If not exactly that, at least the " real rate " doctrine has saved many a writer from intellectual agnosticism like a *deus ex machinâ*, and has been employed to extricate logic from blind-alley pursuits. No apology is, I hope, therefore, necessary for a somewhat searching examination of the worth of this doctrine as a tool of economic thinking.

Fisher's " real rate," to begin with, is not really a valuation of *interest* alone, corrected for price changes; his " real rate " is obtained by correcting *both the interest as well as the principal for price changes*. Thus Fisher's theorem, which is too well known to need any elaborate statement here, is that with the appreciation or depreciation (s) of money in terms of commodities, the " real rate " (R) may widely fluctuate, being (*cet. par.*) positive with rapidly falling and negative with rapidly rising prices. If r is the money rate of interest, then he evaluates that $R = r + s + rs$, or roughly, $= r + s$, the quantity rs being negligible. If s is negative and greater than r, R is also negative, and so on. This R, however, is made up of two elements: it contains in it the depreciation (or appreciation) of the money principal during the given period as well as the depreciation (or appreciation) of the money interest. Thus, for example, if the principal of £100 depreciate from 100 goods (supposing £1 = 1 good, originally) to 90 goods, and £5, the interest, depreciate from the expected 5 goods to 4·5 goods, the sum-total of the result is that the " real rate " has fallen to $-$ 5·5 per cent. This, however, is the joint result of the depreciation of the principal ($-$ 10 goods) and the depreciated value of the interest ($+$ 4·5).

It might be objected that this dissection of the " real rate " of Fisher is of no practical importance, because to the lender who

lends and to the enterpriser who borrows, what matters when prices are fluctuating violently is the sum-total of results, and not the separate elements in the " real rate " here distinguished. But such a view, besides ignoring the fact that clarity is in itself a good, errs in supposing that borrowed capital is always forthwith returned to the lender by the borrower. But this is not true. In the case of long-term, *i.e.*, quasi-permanent or permanent loans, like Consols and debentures, the principal is not returned at all, or, if returned, is done so after such a long time that the lender's foresight as to changes in prices could scarcely affect either his willingness to lend or the industrial situation.[1] Short-term loans are indeed repayable within a period of time during which fluctuations in the price-level might well cause real transfers from the borrowers to the lenders or *vice versa*, to the extent indicated by the " real rate." But the question arises, Is an average lender or borrower (and this question applies to both long as well as short lending) *actually* so hit or benefited to the whole extent of the " real rate " ? Almost always, when the loan, whether short or long, is returned, the lender *re-lends* the principal; he does not liquidate or spend it. *If he did*, he would find himself in a favourable position or otherwise in terms of commodities. On the other hand, the borrower who has returned a loan might be hit or benefited by changes in the value of money to the whole extent of the " real rate," if, on returning the loan, he winds up his business and takes a long holiday. As a matter of fact, he does nothing of the kind; he just goes and re-borrows elsewhere nearly the same amount that he repaid. Thus his gain or loss on the transaction is also imaginary. The fact is that money capital, whether short or long, is a *continuous* process, a mobile fund; it is continually embodied in real capital, either over long periods or over a series of short periods, according to the preference of the lender. Thus, the appreciation or depreciation of the principal lent and repaid, scarcely if ever affects the lender or borrower under ordinary circumstances. This does not mean, however, that the principal itself would not be intrinsically worthless, if there is a spectacular

[1] The fact that by selling his securities on the Stock Exchange a lender may recover his long-term capital at the current market price does not indicate that capital is *returned* by the original borrower to the lender. What happens is just a change of hands for the securities in question: what one lender loses, another lender gains and the transfer does not affect the borrowers *vis-à-vis* the lenders at all. Professor Fisher, we are told, once informed a League of Nations audience, that " in a period of six years in the United States alone capital to the amount of forty milliards of dollars had been transferred from one section of the community to another section." But he could have seen that this sort of operation is not relevant to what he calls the real transfers between borrowers and lenders.

rise of prices, as there was in post-War Germany; such a rise implies an inflation of the total volume of money capital. But assuming that the owner of the principal does not liquidate it by purchasing goods (and there is no need to make a contrary assumption), he will be hit only to the extent to which the money *interest* accruing to him falls in goods value. The debtors, indeed, might well repay their debts and avail themselves of the disparity between the nominal and market values of their investment. If, besides, subsequently there is a complete revaluation of the monetary standard, as there was in Germany, the door will be for ever closed to the lenders possibly recouping their position in a future deflation of prices. But this is, evidently, true only of abnormal events; in normal times in which there are no such catastrophic depreciations followed by revaluations, but only cyclical fluctuations of prices, the creditors can always rely upon balancing their losses and gains arising from price fluctuations.

Apart from all this, the appreciation or depreciation of the money interest itself is an event of some actual importance to the lender, in so far as it is his regular income, which he probably spends, and to the borrower, in so far as it is an element of cost. If the concept of the " real rate " is thus confined to the evaluation of interest alone in terms of goods, it becomes a living and useful instrument, like the analogous concept of real wages. Thus conceived, the " real rate " can never fall to zero or become negative. For instance, in the example given above, the 10 per cent. depreciation of the value of money (or, *i.e.*, roughly, a 10 per cent. rise in the price-level) will bring about a " real rate " of 4·5 per cent. only, and not — 5·5 per cent. Only the money rate of interest will be corrected for price-changes.

The representative borrower-enterpriser, who prospers on the difference, which is profits, between the costs and prices relevant to his products, is generally regarded as benefiting at the expense of the factors of production, when prices are rising. But you cannot say that there takes place a full transfer of real income to the extent of the windfall profit from those factors of production to the enterpriser and, in the same breath, insist that there is another transfer of the same size from the lender to the enterpriser again. The former transfer is the real aspect; the latter is an illusion. But the " real rate " freshly interpreted as the interest itself corrected for changes in the value of money, fits in with the former transfer, as interest, like wages, is also an element of cost.

Fisher's " real rate " doctrine, widely accepted by many economists if not as one possible explanation of cyclical fluctua-

tions, in some way to be a thing to be reckoned with, has thus on examination proved, as it stands, an inaccurate explanation. Fisher himself, who founded an original theory of capital on the basis of the income concept, would have been the first to see clearly wherein his treatment of the "real rate" was faulty if he had concentrated on the *continuity* of capital. The "real rate" doctrine has been applied in another allied topic, that of price stability, in which the "debtor-creditor relation" is held to be one of the primary considerations. Even there, we have, then, to extend the logic of the foregoing paragraphs and regard stability of *interest* payments in terms of goods as the essential fact. What damage (*e.g.*) a debtor country like Argentina would suffer in consequence of a continuous fall of commodity prices is confined to her interest payments; for to provide for these she will have to spare a larger part of her productive capacity. As for the principal repayments, she can very well avoid present damage by re-borrowing to the extent of the repaid loans. That is, in fact what any debtor country would do and does actually.

An important off-shoot of Fisher's theorem, which also needs to be revised in the light of what has been said above, is the existence, to which Fisher directs attention,[1] of "as many rates of interest expressed in terms of goods as there are kinds of goods diverging from one another in value." The method of approach is similar to that of Mr. Sraffa's "commodity rates." (*Vide* his Article in the ECONOMIC JOURNAL, March 1932.) The distinction between Fisher's "real rates" and Mr. Sraffa's "commodity rates" is that while the former refer to the relation between two spot prices of a commodity at two different dates, the latter refer to the relation between the "spot" and the "forward" price for the commodity at the same given moment. Fisher recognises the difficulty of having an indefinite number of "real rates "expressed in terms of different commodities. He, therefore, proposes to evaluate a single "real rate" by reference to the general price-level, which is, of course, his Cash-Transactions Standard, derived from ($MV = PT$), to adopt Keynes's phraseology. This method, while it ignores the practical difficulty that the price-level relevant to the lender's expenditure and that relevant to the borrower's expenditure may considerably diverge, possesses perhaps the merit of simplicity.

It is Fisher's contention that in so far as the fall or rise in the "real rate" due to rising or falling prices can be *foreseen*, by the lenders and the borrowers, the money rate at which lending takes

[1] *Theory of Interest*, p. 42.

place begins to adjust itself to the " real rate " in the upward and downward phases of the business cycle, but never quite catching up with it. Also that his " real rate " fluctuates more than money interest. (This, by the way, is natural, seeing that he has included the correction of principal as well as interest for price changes in his " real rate." Had he interpreted the " real rate " in the narrower sense here proposed, he would have found out that it fluctuates as much, though inversely, as the money rate.) The drift of the argument is that so long as the " real rate " is kept constant, prices will be steady : if there is a deviation from the normal position of the " real rate," prices will fluctuate. The inevitable conclusion drawn is that if, *after such a deviation*, the " real rate " is rehabilitated by raising or lowering the money rate sufficiently to bring it (*i.e.*, the " real rate ") to its normal level, equilibrium of prices would be re-established. Now, while it is indeed true that if prices were stable Fisher's " real rate " would be at its proper or normal level, because neither the principal nor the interest could fluctuate in goods value, it is, as the foregoing argument should have shown, extremely doubtful if the *converse* proposition holds good. At any rate, it is unnecessary for the money rate to be raised or lowered so much as to offset the fluctuation in value not only of interest but also of principal.

The application of the " real rate " theorem to practical banking policy would thus seem to be rather hazardous. I mention this because some authorities appear to support such an extension of the " real rate " doctrine of Fisher to bank-rate policy. It is their notion, *e.g.*, that a 15·5 per cent. money rate would have to be established, if, say, a " real rate " of 5 per cent. is to be obtained when prices are rising at the rate of 10 per cent. per annum and that this would keep the price-level steady, if 5 per cent. is the interest-rate norm. The argument underlying the notion is characteristic for two reasons : in the first place, it believes that the rate of interest in its interactions on business conditions acts or may act in a somewhat compensatory manner; secondly, it supports the Fisherian " real rate " theorem. The former aspect ignores that prices are not moving on an independent plane of their own, but are intimately connected with movements of the interest rate itself. It is not necessary for the money rate to be raised to such stupendous heights at all; for the simple fact of the raising of the money rate will itself arrest the rising prices and slacken their pace. The prices and the rate will then move convergently towards equilibrium, the new rate continually bringing down the new prices.

It can easily be seen that even if the suggested version of the " real rate " is steadied, it would be enough. While, however, so small a change as is indicated by the revised version is sufficient perhaps to *control* prices, it is not certain that it is *the* rate which would maintain their *stability*.

B. P. ADARKAR

BENTHAMISM AND PROTECTION

THE purpose of this short note is to turn the tables on the classical and neo-classical followers of Adam Smith. They have all without exception advocated the free trade policy as the only one in harmony with the correct principles of political economy; and this policy was identified with the classical doctrine to such an extent that its opponents had perforce to declare themselves enemies of the classical school *in toto*.

Yet the advocacy of the policy of free trade is not in perfect agreement with the fundamental postulates of classical economics. The corner-stone of the classical doctrine is Jeremy Bentham's felicific calculus. The calculus is explicitly stated in the *Fragment on Government*; but it is contained, implicitly, in all the works of Smith, Ricardo, Mill, and their successors. According to the felicific calculus, man's behaviour is determined by his measurement of the utility of the several alternatives of conduct; and the dimensions of utility are six, of which the four cardinal ones are multiplicative, the remaining subsidiary ones being additive or subtractive. The modern names of Bentham's four cardinal dimensions of utility are Intensity, Duration, Probability, and Futurity.[1] The subsidiary dimensions are Purity and Fertility.

The doctrine of free trade is based on the analysis of Intensity only. Adam Smith is enunciating a half-truth when he says[2]: " It is the maxim of every prudent master of a family never to attempt to make at home what it will cost him more to make than to buy." On utilitarian lines, the prudent master of a family should ask all of the following six questions instead of only the first:

1. Is it cheaper to buy than to make?
2. Will the irksomeness of making last longer than the irksomeness of paying?
3. Is it certain that the desired object will be always obtainable in the future if it is bought instead of made?

[1] Cf. John R. Commons, *Reasonable Value*, mimeographed, Madison, 1924.
[2] *Wealth of Nations*, Book IV, Chap. ii.

4. Is it more expeditious to buy than to make?
5. In how far is the advantage connected with buying as compared with making outweighed by the disadvantage of having to sell in order to acquire the means of payment?
6. Will buying have the effect of increasing the future capacity to buy, just as making has the effect of increasing the future capacity to make?

The dimension of Probability is possibly the most interesting of the six. It is well known that foreign trade is more risky than domestic trade, being subject to a greater assortment of disturbing influences. Undoubtedly, the policy of free trade, *when successful*, tends to increase the wealth of nations more than a policy of protection; but ought not the size of the factor of probability of success to be taken into account when the adoption of a trade policy is considered?

Adam Smith wrote the *Wealth of Nations* before Bentham had codified the basic principles of the classical analysis. But it is astonishing that the bald acceptance of the free trade policy marred the work of all his successors, and especially that of Bentham himself. It could be said, in extenuation of the attitude of the classical economists, that their thinking was on static lines, and that the possibility of uncertainty is ruled out of the picture of static economy; but such a defence of the classical school would not be just to the defendant. The classical economists considered dynamics as well as statics. They were interested in practical legislation even more than in abstract theory.

List's defence of *Erziehungszölle* [1] is quite in accordance with Bentham's definition of Fertility. New industries are to be protected in order that they may develop to a point where they can withstand foreign competition. The wealth of the nation will be impaired somewhat in the early stage of the growth of such industries, but the benefits derived from their existence will ultimately repay the costs and leave a net gain. This process parallels the well-known example of the gourmand who undertakes the consumption of olives, finding their taste little to his liking at first, but hoping that ultimately he will enjoy them so much that his initial suffering will be more than repaid.

Carey's objections to free trade [2] fall chiefly under the headings of Probability and Purity. Free trade is harmful because it leads

[1] *Das Nationale System der Politischen Oekonomie*, Vol. I.
[2] *Principles of Social Science*, Vol. I, Chap. ii.

to the Centralisation of production in a small number of geographical areas: a calamity such as a war or an earthquake or a pestilence may disrupt foreign trade, whereupon the importing countries will find themselves in dire straits. As against Centralisation, Carey advocates Concentration, *i.e.* the pursuit of all branches of production in every geographical area. Again, free trade is harmful because it prevents the inhabitants of a specialised geographical area from exercising their innate talents in branches of production well suited to their aptitudes, but ill suited to their physical environment. Thus, according to Carey, the policy of free trade infringes on the sway of the fundamental principles of Individuality, Association, Responsibility and Capacity for Progress.

Possibly all scientific criticisms of free trade which were ever made could be subsumed under one or more of the dimensions of utility expounded in Bentham's felicific calculus. And since the felicific calculus is the backbone of classical economics, the doctrine of protection is just as little or just as much a part of the classical system as the doctrine of free trade. It is a pity that the Founders were not more careful in distinguishing between theory and policy. If they had been, their successors would have been spared the tumult of the battles of "free trade" and "protective" "theorists." The problem of protection versus free trade is not a theoretical one. The battles should have been waged between statisticians, politicians, and other experts in questions of expediency; theoretical economists would have been well out of it.

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Stamford, New York.

OFFICIAL PAPERS

Balances of Payments, 1931 and 1932. League of Nations: London, Allen and Unwin. 7*s.* 6*d.*

RECENT figures concerning the balance of international payments of various countries afford some evidence of the effect of the depreciation of the gold value of currencies upon balances of international accounts (trade in goods and services, gold, long and short term capital transactions). Complete accounts for 1931 and 1932 are available for 18 countries, of which 9 had stable and 9 had depreciating currencies; the former recorded an active balance on account of goods and services of $288 million

in 1931 but a passive balance of $63 million in 1932, while the latter " improved " their balance by $534 million.

Moreover, there are signs that this movement has continued during 1933. In the course of the first nine months of that year, the gold and foreign currency reserves of the central banks in countries with depreciating currencies (not counting the United States) appear to have increased by over $500 million gold, while those of countries with stable currencies fell by a similar amount.

A redistribution of liquid assets between the two groups of countries is thus taking place. Many countries with depreciated currencies buy gold or foreign exchange. The funds which thus move in the direction of certain countries on gold are used by them to meet the deficit in their current international transactions.

Undoubtedly the changes thus taking place imply an adjustment of previous disequilibria; but there is a danger of developments being carried beyond the point where normal economic relations between nations can be resumed and maintained.

One of the main achievements during this transitional period of adjustment, which now exceeds two years, is the equilibrium which a number of debtor countries have attained in their balance of payments and the ensuing improvement of their credit which has taken place without the help of foreign capital. Many of these countries have been able to convert their outstanding loans (domestic and foreign) and thus alleviate the burden of their debt. (*Communicated.*)

World Production and Prices, 1925–1932. League of Nations: London, Allen and Unwin. 4*s*.

THE Economic Intelligence Service of the League of Nations has published a substantial study of *World Production and Prices* (a continuation of the *Review of World Production* published last year). This study gives a general survey of the development of production of primary products (food-stuffs and raw materials), and of the activity of the most important industries all over the world, supplemented by a short review of the changes in the quantum of international trade—and, finally, an analysis of the movements of prices on world markets and in various countries. The study is set against the essential background of the years 1925 to 1929, but stress is mainly laid on the developments of the years of world economic depression, 1930 to 1932 and, as far as the available information permits, the first months of 1933.

The following indices extracted from this publication illustrate

the recent effects of world economic depression on the different branches of production and trade (average 1925–1929 = 100) :—

	1929.	1930.	1931.	1932.
Total primary production . .	106	102	98	94
Agricultural production . .	104	103	103	102
Non-agricultural production .	114	101	86	73
Industrial activity . . .	111	100	90	77
Quantum of international trade .	111	102	93	80

The lowest point of the depression in the world's productive activity appears to have been passed about the middle of 1932. Industrial production in general showed an upward tendency during the latter part of 1932. Towards the end of 1932 and in the course of the first quarter of 1933, however, a set-back was noticeable in a number of countries.

The fact that demand for most commodities has declined more than their supply is disclosed by the heavy accumulation of stocks. The fluctuations of these stocks throughout the period considered is analysed in two special sections which have been added to the volume. It may be stated roughly, that 1932 was the first year since 1925 when current production did not exceed current consumption.

The indices of the quantum of trade, given for purposes of comparison, show that world trade in both primary and manufactured goods considered separately has diminished more than world production of these two groups of commodities.

The chapter on price movements forms a natural corollary to the analysis of changes in production. Here attention is particularly directed to the course of prices since the widespread abandonment of the gold standard towards the end of 1931. It is shown that the rapid fall in gold prices continued practically without interruption until the middle of 1932. After a sharp upward movement following the Lausanne Conference, most price indices fell again during the last two months of 1932 and the greater part of the first quarter of 1933. In March 1933, prices in most countries stood at their lowest point of the depression. The abandonment of the gold standard by the United States, however, caused another upward tendency.

The price discrepancies between various groups of products continued to be aggravated during the course of 1932. Agriculturists have been affected with special severity by the fall in prices, as the goods they sell have fallen more in price than the goods they buy. The terms of trade have turned sharply against

States exporting crude food-stuffs and raw materials and importing finished products. The discrepancies between wholesale and retail prices have persisted, and, contrary to most previous experience, investment goods have fallen less in price than consumption goods. (*Communicated.*)

CURRENT TOPICS

THE Annual General Meeting of the Society, held in the London School of Economics on April 20, was made an occasion for entertaining the members of the International Statistical Institute who were present in London for their own London Meeting and for the centenary of the Royal Statistical Society. Members of the Society entertained the members of the International Statistical Institute at tea at 4.15, when a large attendance was present. Subsequently Professor Edwin Cannan delivered his Presidential Address on "The Future of Gold in relation to Demand," which is printed at the beginning of this issue of the JOURNAL. The Society then proceeded to the formal business of the year, after which a dinner was arranged for members of the Society and their friends, at which 136 were present, followed by a special performance of Ballet at Sadler's Wells Theatre. This performance was specially arranged for members of the Royal Statistical Society, for the International Statistical Institute, and for members of the Royal Economic Society and their friends, of whom between 600 and 700 were present in all. The performance included Tschaikovsky's *Casse Noisette* and Vaughan Williams' *Job* (to designs after William Blake). Members of the Society were particularly pleased to have Mrs. Alfred Marshall amongst them both at the Annual Meeting and the subsequent gatherings.

THE Report of the Society for the year 1933 showed an ordinary income of £4,767 16*s.* 10*d.* and £660 9*s.* 10*d.* in receipts from life compositions. The excess of income over expenditure for the year, together with receipts from compounders, came to £750.

The Secretary reported that 423 new Fellows and Library members had been elected during the year, bringing the total membership of the Society to 4,414, including 938 compounders, as compared with 4,374 last year, 2,875 in 1927, and 694 in 1914. Professor Cannan was re-elected President of the Society for a third term, and Sir H. Llewellyn Smith was added to the list of the Society's Vice-Presidents.

PROFESSOR D. H. MACGREGOR has resigned, as from the publication of this issue, the joint editorship of the ECONOMIC JOURNAL, which he has held since the death of Professor Edgeworth in 1926. The Council have decided to revert for the present to a sole editorship-in-chief of the JOURNAL, which will be held by Mr. J. M. Keynes; and they have appointed as assistant editor Mr. Austin Robinson, Fellow of Sidney Sussex College, Cambridge, University Lecturer in the Faculty of Economics and lately Secretary of the Faculty Board.

THE following have been admitted to membership of the Royal Economic Society :—

Agarwala, Dr. B. S.
Barry, R. Smith.
Beale, L. B.
Benzie, J. M.
Bryan, W. O. E.
Campbell, I. B.
Chang, C. C.
Clappé, N.
Clark, Prof. G. N.
de Beer, J. J.
Grundwald, Dr. K.
Grundy, J. S.
Haynes, W.
Heptinstall, R. H.
Hoffman, H. R.
Jeno, Dr. A.
Kwapong, E. A.
Landau, M. A. J.
Loewi, G. F.
Maxton, J. P.
Mitra, C. C.
Mukerjee, N.
Nathan, Dr. O.
Nyilassy, W. T. G.
Osborn, Sir Francis, K.B.E., C.B.
Parker, F. E.
Poojara, C. M.
Pratt, T. A.
Puri, A. S.
Shakespeare, P. C.
Tongue, W. F.
von Zeuner, F. H.
Wharton, L. E.
Wilson, F. S.

The following have compounded for life membership of the Society :—

Kapadia, Dorab B.
Maru, A. H.
Migliorisi, F.
Reis, F. T. de Souza.
Van der Horst, S. T.
Wheatcroft, Miss M.
Yu, T. Y.

The following have been admitted to Library membership of the Society :—

De Javasche Bank, Amsterdam.
Department of Finance, The Hague. (Composition for fifteen years' subscriptions.)
Director of Statistics, United Provinces, Cawnpore.
John Winthrop House Library, Cambridge, Mass.
Tokyo University of Commerce Library.

Dr. James Bonar sends the following addenda to his Catalogue of the Library of Adam Smith :—

The appearance in 1932 of the 2nd edition of the Catalogue of the Library of Adam Smith has had the same fortunate effect as followed the 1st edition in 1894; several more books " bearing the name-plate of Adam Smith or otherwise authenticated as his " have been reported to the editor. Such are :—

The History of Mankind, by James Dunbar, 1780. Owner, Mr. J. A. Petrie of Edinburgh, 1933.

Life of Pythagoras, and two other lives, by Iamblichus, quarto; Kuster, Amsterdam, 1707. Owner, Mr. Ed. Marshall; informant, Dr. Piero Sraffa, 1933.

Ancient Inhabitants of the Northern Part of Great Britain and Scotland [esp. the Picts], by Father Innes [Thos. Innes, M.A., of the Scotch College at Paris]; two volumes, octavo, calf. London, 1729. Owner, Prof. W. R. Scott of Glasgow, 1932.

Isocrates—λόγοι ἅπαντες καὶ ἐπιστολαί. Basel, Guarinus, 1571. Owner, Mr. G. F. Shove, Cambridge, 1932.

Recherche de la Vérité, by Malebranche (Father) Nicolas. The first only out of three volumes, of the 3rd edition, revised and enlarged. Paris, Pralard, 1678. [The 1st edition is of 1674.] Presented to Glasgow University Library by Dr. Stephan Bauer, 1932.

The book-plate is high placed, as in Scot's *Swaggering State of the Scots Statesmen* (Catalogue, p. 164), now recovered and owned by Glasgow University Library, its date of first printing now shown to be 1754, not 1750.

History of the late Minority during the years 1762–5. Printed first in 1765 and reprinted by John Almon with additions in 1766, pp. 332. London [Anon.], 8vo, old calf. Seen by Mr. Henry Higgs in a bookseller's catalogue of 1933.

The British Association is to meet this year in Aberdeen from September 5 to 12. Professor H. M. Hallsworth will preside over Section F (Economic Science and Statistics) and will deliver his presidential address on " The Future of Rail Transport " on Friday, September 7. An important discussion on " Economic Planning " has been arranged for Monday, September 10, which will be opened by Professor D. H. Macgregor and summed up by Sir Josiah Stamp. Among those who have promised to partici-

pate in this discussion are Professor Alexander Gray and Professor W. F. Bruck. The session on Thursday, September 6, is to be devoted entirely to Scottish economic problems, and in this the contributors will be Dr. Hamilton on "Organisation of the Fishing Industry"; Mr. W. H. Marwick on "The Economic Development of Victorian Scotland," and Mr. E. D. McCallum on "Recent Economic Changes in Scotland."

Among other papers which have been promised there may be mentioned those of Professor F. W. Ogilvie on "The Significance of International Trade Accounts"; Professor Bruck on "Risk and its Significance in Modern Economy"; Mr. J. K. Eastham on some aspects of Regulated Marketing; Mr. R. B. Bryce on "The Wheat Problem," and Mrs. Cartwright on Statistical Investigations into Industrial Fluctuations.

In the afternoons special sessions are to be arranged on industrial problems, including a session devoted to the discussion of "The Need for a Technique of Economic Change" which will be opened by Sir Josiah Stamp. Further particulars of the arrangements can be obtained from the Recorder of the Section, Dr. K. G. Fenelon, College of Technology, Manchester 1.

In the Catalogue recently circulated to members of the Royal Economic Society particulars were given of the publications of the New York National Bureau of Economic Research, which had been published and were available on special terms to Members of the Royal Economic Society. It is now possible to add a further volume to this list, namely :—

German Business Cycles, by Dr. Carl T. Schmidt, pp. 283, 8 charts, 20 tables. Published at $2.50—available to members of the Royal Economic Society at 7*s.* 6*d.*

Applications for this volume, as for other publications in the list lately circulated, should be sent, accompanied with a remittance, to Mr. S. J. Buttress, 6 Humberstone Road, Cambridge.

RECENT PERIODICALS AND NEW BOOKS

Journal of the Royal Statistical Society.

1934. Part I. *On some points relating to Vital Statistics, more especially Statistics of Occupational Mortality.* G. U. YULE. *The Interpretation of the Statistics of Unemployment.* J. A. DALE. *Recent Advances in Mathematical Statistics.* J. O. IRWIN. *Indian Agricultural Statistics.* H. SINHA.

Economica.

FEBRUARY, 1934 (New Series, No. 1). *Some Aspects of the American Recovery Problem.* W. BEVERIDGE. *On Mediæval History as a Social Study.* E. POWER. *The Economic Theory concerning Patents for Inventions.* A. PLANT. *A Reconsideration of the Theory of Value. Part I.* J. R. HICKS. *The Rôle of Time in Economic Theory.* P. N. ROSENSTEIN-RODAN.

International Labour Review.

FEBRUARY, 1934. *The Development of the Two-Shift System in Great Britain.* H. M. VERNON. *Social Insurance Medical Services.* A. TIXIER. *Forest Camps for Unemployed Young Men in the U.S.* H. DUBREUIL. *The Recent Evolution of Trade Unionism in the U.S.S.R.*

MARCH, 1934. *The Regulation of Collective Employment Relations in Agriculture in Italy.* B. BIAGI. *Collaboration between Placing and Unemployment Insurance Institutions.* M. SCHOELER. *Invalidity, Old-Age, and Widows' and Orphans' Insurance at the Seventeenth Session of the International Labour Conference: I.*

APRIL, 1934. *The New German Act for the Organisation of National Labour.* (Ed.). *Some Problems in the Construction of Index Numbers.* J. LINDBERG. *Invalidity, Old-Age, and Widows' and Orphans' Insurance: II. The Codes of Fair Competition in the United States.*

Population.

FEBRUARY, 1934. *Population Changes in England and Wales: Families and Dwellings:* 1921–1931. E. C. RHODES. *The History of Longevity in the United States.* L. I. DIBDIN and A. J. LOTKA. *Racial and Social Problems in the Light of Heredity.* R. R. GATES. *The Concept of an Optimum in Population Theory.* L. M. FRASER. *A Note on the Population of Egypt.* M. EL-DARWISH and EL-S. AMI. *Migration in the Twentieth Century.* J. COATMAN. *Organisation for Research in Population.* H. P. FAIRCHILD. *Some Studies in Vital Statistics in Villages in Jugoslavia.* O. LODGE.

Review of Economic Statistics.

FEBRUARY, 1934. *General Economic Conditions in the United States.* (Editorial.) *British and French Economic Conditions. Gold and Prices* (*Statistical Tables*).

Review of the Year 1933. J. B. HUBBARD and W. L. CRUM. *The Automobile Industry.* F. L. HAYFORD. *Devaluation.* C. J. BULLOCK.

Quarterly Journal of Economics.

FEBRUARY, 1934. *Labor under the German Republic.* W. T. HAM. *Guaranty of Deposits under the Banking Act of* 1933. G. EMERSON. *The Price of Silver and Chinese Purchasing Power.* T. J. KREPS. *Prices under Competition and Monopoly: some Concrete Examples.* V. A. MUND. *Adam Smith, America, and the Doctrinal Defeat of the Mercantile System.* C. R. FAY. *Professor Chamberlin's Theory of Limited Competition.* A. J. NICHOL.

Journal of Political Economy.

FEBRUARY, 1934. *John Laurence Laughlin,* 1850–1933. J. U. NEF. *Agricultural Credit Legislation of* 1933. H. H. PRESTON and V. W. BENNETT. *Economic Evolution: Dialectical and Darwinian.* A. L. HARRIS. *A Re-Appraisal of Cournot's Theory of Duopoly Price.* A. J. NICHOL. *The Emergency Road Transport Act of* 1933. R. W. HARBESON.

APRIL, 1934. *The Failure of Monetary Policy to prevent the Depression of* 1929–32. L. CURRIE. *Business and the Law.* M. W. WATKINS. *Inflation and Enterprise in France,* 1919–26. M. J. WASSERMAN. *Workmen's Compensation Experience in Ohio during the Depression.* L. LEVINE. *Robinson's Economics of Imperfect Competition.* J. A. SCHUMPETER and A. J. NICHOL.

American Economic Review.

MARCH, 1934. *Liberal Theory of Constructive Statecraft.* A. P. USHER. *Economics and the National Recovery Administration.* J. M. CLARK. *Budget Balancing and Economic Stabilisation.* J. B. CANNING and E. G. NELSON. *Emergency Budget of the U.S.* J. W. SUNDELSON. *Concentration of Economic Power.* W. L. CRUM.

Supplement. *Papers and Proceedings of the Forty-Sixth Annual Meeting of the American Economic Association. The History of Recovery.* W. L. THORP. *Public Utilities in the Depression.* E. W. MOREHOUSE, and others. *The Transportation Problem.* H. G. MOULTON, and others. *Marketing under Recovery Legislation.* R. S. VAILE, and others. *Economics of the Recovery Act.* J. DICKINSON, F. A. FETTER, and others. *Measurement of Unemployment.* M. H. GIVENS, and others. *Banking and Monetary Legislation.* E. W. KEMMERER, and others. *The Rehabilitation of Agriculture.* H. WALLACE, and others. *Public Finance in the Depression.* F. R. FAIRCHILD, and others. *Unemployment and Public Works.* S. H. SLICHTER, and others.

Annals of the American Academy of Political and Social Science.

JANUARY, 1934. *Banking and Transportation Problems.* The first Part deals with reforms in the American Banking System, under

the titles of *Commercial Banking, Investment Banking Reform, The Place of the Federal Reserve System*, and *Problems of Monetary Policy*. The second Part deals with *The Railroads, The Waterways, The Pipe Lines*, and *The Highways*. By various authors.

MARCH, 1934. *Towards National Recovery; a résumé of the Work of the National Recovery Administration, with special reference to Business, Labor, and the Consumer.* By various authors.

Wheat Studies.

(Food Research Institute, California.)

FEBRUARY, 1934. *Price Relations between May and New-crop Wheat Futures at Chicago since* 1885.

MARCH. *Environment, Heredity and Wheat Quality.* Climate is more important in determining wheat quality than soil or wheat variety.

Revue d'Économie Politique.

NOVEMBER, 1933. *Le problème autrichien.* V. KIENBOECK. *Du monopole bilatéral.* F. ZEUTHEN. *Les émissions d'emprunts au-dessous du pair.* A. MARCHAL.

JANUARY, 1934. *La place rationelle des syndicats dans les societés modernes.* L. DE BROUCKERE. *Fluctuations économiques et rendements fiscaux.* H. LAUFENBURGER. *La crise socialiste et le "neo-socialisme."* E. LASKINE. *Une innovation dans le commerce de détail: les magasins à prix uniques.* R. PICARD. *Les investissements dans l'économie capitaliste et dans l'économie planifiée.* R. MOSSE.

Journal des Économistes.

JANUARY, 1934. *L'Industrie lainière.* R. J. PIERRE.

Schmollers Jahrbuch.

FEBRUARY, 1934. *Theoretische Bemerkungen zum nationalsozialistischen Wirtschaftsprogram.* C. BRINKMANN. Freedom and the sense of value. Freedom of competition and exploitation of the conjuncture. From the class-war to the struggle for existence. *Einige Bemerkungen über das Für und Wider in der Problematik der Konjunkturbarometer.* O. WEINBERGER. A discussion, based on R. Gater's criticism of the barometer of the Harvard Institute, of types of economic barometers, choice of range, definition of trends, causality and correlation. *Organisierter Kapitalmarkt.* G. BERKENKOPF. The necessity of organisation; criticism of some schemes of reform, especially of nationalisation; the faults of the present structure, and proposals for a new method. *Bevölkerungsgang und Landwirtschaft im ausgehenden Mittelalter im Lichte der Preis- und Lohnbewegung.* W. ABEL. *Wirtschaft und Wissenschaft.* K. DIEHL. An account and critical estimate of the fundamental ideas of the work of Gottl.

Zeitschrift für Nationalökonomie.

MARCH, 1934. *Wie können unmessbare psychische Grössen in das Gleichungssystem des wirtschaftlichen Gleichgewichts eingeführt werden?* A. DILIMOVIC. The author analyses the traditional

equations of the equality of elementary and weighted marginal utility by the aid of which the subjective factor is introduced into the equations of equilibrium. He argues that these equations are founded on two unreal assumptions—first, the indefinite divisibility of economic goods, second, the measurability of marginal utility. In his view, the "conditions of maximum satisfaction" take the place of the traditional equations. *"Federal Reserve Act" und die amerikanische Währungspolitik.* A. CABIATI. A review of Laughlin's book, continuing up to the present the examination of the main problems. *Die zeitliche Determinierung des Konjunkturbruches.* V. BLOCH. An examination of the problem of the moment of reversal of the up-swing of the cycle. *Über eine Methode zur Berechnung der Elastizität der Nachfrage und die Kritik Prof. Amorosos daran.* H. SCHULTZ. A detailed explanation of the method of finding functional relationship, not between absolute prices and quantities, but between relative changes in them. *Zur Lohntheorie und Zinstheorie.* E. VAN GENECHTEN. *Zur Methodologie der Sozialwissenschaften.* F. KAUFMANN.

Weltwirtschaftliches Archiv.

MARCH, 1934. *Zur Psychologie der Weltwirtschaft und ihrer Krisis.* E. WISKEMANN. The crisis indicates a world change in psychology and sentiment. The author analyses the basis of economic and world-economic confidence. He also traces the psychological background of the politico-economic evolution of the nineteenth century, especially in England and Germany. An economy of the former kind cannot be restored. *Der Donauraum in der Weltwirtschaft.* E. HANTOS. *Der Automatismus der Goldwährung.* E. FOSSATI. The author seeks to prove that the automatism of the gold standard was never a reality. He argues this by examination of the elements of time, credit, the quantity theory, and the "passive" rôle of central banks.

South African Journal of Economics.

MARCH, 1934. *Economic Method and the Conception of Competition.* W. H. HUTT. *The World Agricultural Crisis.* S. D. NEUMARK. *Tariffs and Economic Nationalism.* T. O. WILLIAMS. *Building Society Finance.* J. J. I. MIDDLETON.

The Sociological Review.

APRIL, 1934. *The Future Population of Great Britain.* G. C. LEYBOURNE.

The Ceylon Economic Journal.

DECEMBER, 1933. *The Shipping Conferences and the Deferred Rebate System in Ceylon.* M. FERNANDO. Argues that the Ceylon Shipping Conference has obtained a strangle-hold over the destinies of the island, which is a serious menace; and that the Government should illegalise the deferred rebate, as in Australia and the United States. *Four Years of the Depression.* B. B. DAS GUPTA. *Shipping Economics and some Aspects of Indo-Ceylon Trade.* H. M. DESAI. *Economic Problems of Democracy.* N. M. PERERA. *Indo-Ceylon Tariff References.* B. B. DAS GUPTA.

Kyoto University Economic Review.

DECEMBER, 1933. *On the Textiles Consumption Tax.* M. KAMBE. *Saving as the Costless Process.* Y. TAKATA. *The Commoner Class of the Tokugawa Period.* E. HONJO. *The Meaning of the Theory of Value in Theoretical Economics.* K. SHIBATA.

Index (Stockholm).

FEBRUARY, 1934. *The Development of Sweden's Foreign Trade and Shipping in* 1925–1933.

MARCH, 1934. *Certain Aspects of World Trade in Graphic Form.*

APRIL, 1934. *Swedish Economic Conditions since* 1925, *in Graphic Form.*

Monthly Bulletin on Economic China.

JANUARY, 1934. *Land Tax in Chekiang.* F. L. HO. *Economic Statistics in China.* H. D. FONG. *Statistical Appendices.*

De Economist.

NOVEMBER, 1933. *Het loononderzoek van het Centraal Bureau voor de Statistiek.* N. J. POLAK. The Central Bureau for Statistics has issued a report on the influence of wages on cost of production. Statistics always appear too late, especially those resulting from a special inquiry. But it does not follow that they are useless; they may be applied to another problem. In the present case, the problem which led to the compilation of these statistics is, for various reasons, no longer urgent; but the analysis of costs, etc. may be applied to the question of devaluation. The figures in the report relate to 1929; they are here adjusted to 1933, and thereafter the effects of a 25 per cent. devaluation are considered on the costs of a number of industries. These are: building, milk products, bread, sugar, pork, potatoes and vegetables, clothes, shoes and electricity. In conclusion, assembling the various results, the effect of a 25 per cent. devaluation on the family budget is considered. It is suggested that such a devaluation would not result in a rise of more than 5 per cent. in the cost of living. *Industrieele credietverleening in Groot-Brittannië.* J. W. TH. COHEN STUART. A discussion of recent developments in the relations of the banking system to industry in Great Britain, with special reference to the Securities Management Trust and the Bankers' Industrial Development Company.

DECEMBER, 1933. *Vrouwenarbeid in crisistijd.* ANNA POLAK. In connection with an article by Marguerite Thibert, in *The International Labour Review*, the writer discusses the effects of the crisis on the employment of women. Unemployment statistics, whether from official sources relating to unemployment insurance or from Trade Unions for various reasons fail to give a satisfactory answer to the question of the relative extent and increase of unemployment among men and women. In explaining why statistics are unreliable on this point, it is claimed that unemployment among women may be presumed to be greater than is revealed by statistics. A wide survey of available information relating to most European countries is given, and on the two points more specifically raised it is claimed that (i) unemployment is not to be attributed to women's work; and (ii) the prohibition of women's work would

be economically and morally disadvantageous rather than advantageous for mankind. *Dr. Emile Verviers' berekening van ons volksvermogen.* D. F. TIMMER. A criticism of the calculations with regard to the national wealth and the indebtedness of industry made by Dr. Verviers in his article in the May number. While the writer does not question the serious position of the "undertaking classes," he argues that Dr. Verviers' calculations cannot be accepted as accurate.

JANUARY, 1934. *Is de revalorisatie van zilver mogelijk?* W. J. L. VAN ES. On the relation of silver and gold. The writer argues that the value of gold is affected by its use as "cover" (*dekking*), and that this use impairs the functioning of gold as a standard. The influence which the "minimum cover" has on gold varies according to the economic ebb or flow. At no time since 1929 has gold been stable in value. The cause lies in the use of gold as cover, which introduces an element wholly alien to the nature of a standard. In discussing gold, figures are given, showing an abnormal proportion sterilised in 1928. Debtors failed, in search of gold, which they themselves and the creditor states had sterilised. Revalorisation of silver is an impossibility unless sterile gold is brought forth to fulfil a useful function, or unless silver is admitted in full measure as cover. Stimulation of coinage of silver token currency, and increase of silver content would be too small and too slow a progress to raise the value of silver. It is necessary to consider whether the changed price of silver is due to a change in the marginal value of gold or of silver. It is argued that the marginal utility of silver has not really changed. It is not revalorisation, but reappreciation that is required. The word "revalorisation" is a cause of misunderstanding. *De buitenlandsche schulden van Duitschland.* H. C. STROHMAYER. An estimate and an analysis of German foreign indebtedness, arranged under nature of debts, creditor countries and payments due to various countries.

Giornale degli Economisti.

DECEMBER, 1933. *La crisi del dollaro.* G. DEL VECCHIO. Having regard to the unsound industrial and financial policy pursued by the United States prior to 1929, and to the disastrous period of deflation which has succeeded, it may well be that measures of inflation represent at the present time a lesser evil than the continued process of shrinkage of the national increase and increase in the burden of debts. *I due tipi fondamentali di indagine nell' ambito dell' economia finanzaria.* R. FUBINI. *Sui metodi per lo studio della fecondità dei matrimoni.* G. MORTARA. *Impressioni su alcuni aspetti dell' industria britannica.* C. PAGNI. Some impressions derived from a visit to a number of centres of British industry.

JANUARY, 1934. *Dell' automatismo economico al corporativismo.* B. BIAGI. *I problemi dell' esportazione e della politica commerciale.* SENATOR A. ASQUINI, who is Under-Secretary of State for Corporations, contends that the only hope of increasing the possibilities of export lies in bilateral commercial treaties combined with adherence to the most-favoured-nation clause. The Ottawa conventions, which discriminate against Italy, raise the question whether

it will be possible to continue to extend the benefit of most-favoured-nation treatment to the British Empire. The quota method is unsound both in principle and practice, and the most effective way of stimulating the export trade is to reduce costs of production. *Di alcuni effetti finanziari dell' ammortemento del debito pubblico.* E. D'ALBERGO. A lengthy article dealing in considerable detail with the alternative methods of reducing or extinguishing the public debt by means of a capital levy or by a sinking fund spread over a long term of years. The writer criticises certain of the views of Professor Pigou on this subject. *La corporazione.* G. BASSANI.

FEBRUARY, 1934. *Nuovi dati sulla natalità in Italia.* G. MORTARA. *I "codici" dell' industria nord-americana di leale concorrenza (fair play).* F. LUZZATTO. *Cenni di teoria della politica economica.* A. BREGLIA. *Ancora in tema di curva di domanda.* V. DOMINADÒ.

La Riforma Sociale.

JANUARY–FEBRUARY, 1934. *Per la represa delle esportazioni.* SENATOR G. AGNELLI, the President of the Fiat Company, argues that attempts to stimulate exportation by further lowering wages or by devaluating the lira are undesirable. He would constitute what would be in effect a state monopoly of exportation and importation, operated through the machinery of the Corporative organisation of the State. Exports would be sold at world market prices, but imports would be sold to Italian consumers at prices sufficient to enable exporters to receive a subsidy equal to the difference between export-prices and costs of production including a fair profit. *Debiti.* L. EINAUDI. An attack on the monetary policy recently advocated by Professor Irving Fisher in his article "The Debt-Deflation Theory of Great Depressions," published in *Econometrica*, October 1933. 50, *o* 60? *Nel centario di vita del dollaro.* PROFESSOR A. CABIATI continues his destructive criticism of American monetary policy. *Banche d'emissione e banche libere (in tema di divagazioni bancarie.* M. MAZZUCCHELLI. *In dennizzo al conduttore migliorante.* A. LORIA. A plea for compensation for improvements for tenant farmers. *Utili da acquisto di azioni proprie.* V. S. MANGANO. *Il problema della montagna—Evoluzione e crisi dell' economia rurale appenninica.* M. BANDINI. *I pensionati dello Stato.* F. A. RÉPACI.

NEW BOOKS

British.

ABBATI (A. H.). Unclaimed Wealth Utilisation Committee, Geneva. Economic readjustment in 1933: the third series of Bulletins. P. S. KING. $8\frac{1}{2}''$. Pp. xiii + 102. 6*s*.

ASHTON (T. S.). Economic and Social Investigations in Manchester, 1833–1933: a Centenary History of the Manchester Statistical Society. P. S. King. $8\frac{1}{2}''$. Pp. xii + 179. 5*s*.

BRIGGS (M.) and JORDAN (P.). Economic History of England. University Tutorial Press. $7\frac{1}{4}''$. Pp. xii + 524. 9*s*. 6*d*.

BRODRICK (J.). The Economic Morals of the Jesuits. Oxford University Press. 8½″. Pp. 158. 5*s*.

COLE (G. D. H.). Studies in World Economics. Macmillan. 8½″. Pp. vii + 285. 12*s*. 6*d*.

DALTON (H.), THOMAS (B.), REEDMAN (J. N.), HUGHES (T. J.), and LEANING (W. J.). Unbalanced Budgets: a Study of Financial Crises in Fifteen Countries. Routledge. 8½″. Pp. xi + 468. 15*s*.

DAVIES (D. J.). The Economic History of South Wales prior to 1800. Cardiff: University of Wales Press Board. 9½″. Pp. xi + 171. 8*s*. 6*d*.

DOCKER (F. J.). Douglas Delusions: a critical examination of the Douglas Credit Proposals. Sydney, N.S.W.: Angus and Robertson (London: Australian Book Co.). 7¼″. Pp. vi + 244. 4*s* 6*d*.

DUBEY (D. S.) and AGRAWAL (S. L.). Elementary Statistics for Indian Students. Vol. I. Allahabad: The Indian Press. 8½″. Pp. 336. *Rs*. 8.

DUNKMAN (W. E.). Qualitative Credit Control. London, P. S. King. 8″. Pp. 345. 15*s*.

EINZIG (P.). The Economics of Rearmament. Kegan Paul. 7¼″. Pp. 179. 6*s*.

FELLNER (F. V. de). Communications in the Far East. P. S. King. 8½″. Pp. 362. 15*s*.

FORD (P.). Work and Wealth in a Modern Port: an economic survey of Southampton. Allen and Unwin. 8½″. Pp. 223. 10*s*. 6*d*.

GIFFORD (J. L. K.). The Devaluation of the Pound. P. S. King. 7¼″. Pp. viii + 114. 5*s*.

GRANT (I. F.). The Economic History of Scotland. Longmans, Green. 7¼″. Pp. 295. 5*s*.

HARRIS (H. L.). The Economic Resources of Australia. Sydney, N.S.W.: Angus and Robertson (London: Australian Book Co.). 7¼″. Pp. 125. 3*s*. 6*d*.

HENDERSON (W. O.). The Lancashire Cotton Famine, 1861–1865. Manchester University Press. 8½″. Pp. xii + 178. 8*s*. 6*d*.

HOLLIS (C.). The Breakdown of Money: an historical explanation. Sheed and Ward. 6″. Pp. 232. 4*s*. 6*d*.

ISLES (K. S.). Wages Policy and the Price Level. P. S. King. 6″. Pp. 256. 9*s*.

London School of Economics. A London Bibliography of the Social Sciences: being the subject catalogue of the British Library of Political and Economic Science at the London School of Economics, the Goldsmiths' Library of Economic Literature at the University of London, the Libraries of the Royal Statistical Society and the Royal Anthropological Institute, and certain special collections at University College, London, and elsewhere. First supplement, containing the additions to the Libraries named above, 1st June, 1929, to 31st May, 1931. London: L.S.E. 10″. Pp. xii + 596.

MARQUAND (H. A.). Industrial Relations in the United States of America. Cardiff: University Press Board. 7¼″. Pp. ix + 105.

MORGAN-WEBB (SIR C.). The Rise and Fall of the Gold Standard. Allen and Unwin. 7¼″. Pp. 187. 5*s*.

MURPHY (J. T.). Preparing for Power: a critical study of the history of the British working-class movement. Jonathan Cape. 7½″. Pp. 290. 6*s*.

NADLER (M.) and BOGEN (J. I.). The Banking Crisis: the end of an epoch. Allen and Unwin. 7¼″. Pp. 210. 6*s*.

New Survey of London Life and Labour. Volume VI, Survey of Social Conditions, (2) The Western Area (Text). Pp. xv + 468. 17*s*. 6*d*. Volume VII, Survey of Social Conditions, (2) The Western Area, Maps. 17*s*. 6*d*. P. S. King. 8½″. 2 vols.

ORTON (W. A.). Prelude to Economics. Pitman. 6″. Pp. 285. 5*s*.

PAGE (F. M.). The Estates of Crowland Abbey: a study in Manorial organisation. Cambridge University Press. 8½″. Pp. xiv + 462. 21*s*.

PAISH (F. W.) and SCHWARTZ (G. L.). Insurance Funds and their Investment. P. S. King. 7¼″. Pp. x + 117. 4*s*. 6*d*.

PLUMMER (A.). International Combines in Modern Industry. Pitman. 8¼″. Pp. 191. 7*s*. 6*d*.

PORTUS (G. V.). Australia: an economic interpretation. Sydney, N.S.W.: Angus and Robertson (London: Australian Book Co.). 7¼″. Pp. 104. 3*s*. 6*d*.

RAY (P.). India's Foreign Trade since 1870. Routledge. 8½″. Pp. xviii + 300. 12*s*. 6*d*.

ROBERTSON (C. J.). World Sugar Production and Consumption: an economic-geographical survey. John Bale Sons and Danielsson. 7¼″. Pp. 142. 5*s*.

STEVENSON (E. F.). Unemployment Relief: the basic problem. Allen and Unwin. 7¼″. Pp. 284. 6*s*.

THOMAS (S. E.). The Rise and Growth of Joint Stock Banking. Vol. I (Britain: to 1860). Pitman. 9″. Pp. viii + 689. 20*s*.

TODD (J. A.). The Marketing of Cotton, from the Grower to the Spinner. Pitman. 8½″. Pp. xi + 250. 10*s*. 6*d*.

WHITE (A. B.). The Nationalisation of Banking. Allen and Unwin, and the Fabian Society. 7¼″. Pp. 74. 1*s*. 6*d*.

WILSON (R. M.). Promise to Pay: an inquiry into the principles and practice of the latter-day magic called sometimes high finance. Routledge. 7¼″. Pp. 148. 3*s*. 6*d*.

WOLFENDEN (H. H.). Unemployment Funds: a Survey and a Proposal. Toronto, Macmillan. 8½″. Pp. xviii + 229.

American.

ADAMS (A. B.). Our Economic Revolution. University of Oklahoma Press. 9″. Pp. 196. $1.50.

BEARD (C. A.) and SMITH (G. H. E.). The Future Comes: a Study of the New Deal. Macmillan. 5″. Pp. 178. 5*s*.

BOND (B. W.). The Civilisation of the Old North-West. Macmillan. 7″. Pp. 543. 15*s*.

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